DOCUMENT RESUME

ED 058 917	52	LI 003 423

AUTHOR	Markuson, Barbara Evans; And Others
TITLE	Automation and the Federal Library Community.
INSTITUTION	System Development Corp., Falls Church, Va.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C. Bureau of Research.
REPORT NO	TM-WD-5402
BUREAU NO	BR-0-9005
PUB DATE	Jul 71
CONTRACT	OEC-70-3952
NOTE	299p.; (10 References)
EDRS PRICE	MF-$0.65 HC-$9.87
DESCRIPTORS	*Electronic Data Processing; *Government Libraries; Information Retrieval; *Library Automation; *Library Planning; *Library Programs; Library Surveys
IDENTIFIERS	*Federal Library Committee Task Force

ABSTRACT

The third phase of a four-phase program developed by the Federal Library Committee Task Force on Library Automation in conjunction with its overall objective of reviewing and reporting upon the status of automation in Federal libraries is reported. The first phase of the overall program appraised the current activities in library automation and identified major trends. The second phase involved a series of studies reporting on the history and development of selected Federal library automation projects. The third phase, reported here, had three goals: (1) study and define library operations susceptible to automation; (2) survey and describe in meaningful terms, the current techniques of automation which are potentially useful in library applications and (3) establish criteria for making determinations as to feasibility, functions to be automated, types of hardware and software to be used, internal and external services, and extent of involvement with other systems. The three major tasks of this phase were: (1) a survey of the Federal library community, (2) preparation of a handbook to guide Federal librarians in automation feasibility and planning and (3) preparation of a report summarizing the survey results, and automation findings, and presenting recommendations for phase four. (Author/NH)

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AUTOMATION AND THE FEDERAL LIBRARY COMMUNITY

by

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July 1971

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System Development Corporation

Falls Church, Virginia

LI 003 423

24 p.
10

FOREWORD

This Report and the research reported therein were performed by System Development Corporation under Contract Number OE CO-70-3952 with the Office of Education, U.S. Department of Health, Education and Welfare.

Although the Report was primarily the responsibility of the authors listed on the title page, it reflects work carried out by the entire SDC project team. The team included: Barbara Evans Markuson, Project Director, and Donald V. Black, Karl M. Pearson, Jr., Sharon Schatz, and Judith Wanger. Dr. Robert Katter assisted in the survey design methodology, and Ruth Patrick assisted in the early stages of the project. All work was performed under the general supervision and guidance of Dr. Carlos A. Cuadra, Manager of the Education and Library Systems Department.

We are indebted to many individuals in the Federal library community who provided us with detailed information about their operations and, in many cases, with valuable ideas and suggestions. We are particularly indebted to the members of the Federal Library Committee Task Force on Automation for their constructive criticisms and support.

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CHAPTER I. BACKGROUND OF STUDY

INTRODUCTION

This project, which was initiated by the Federal Library Committee Task Force on Library Automation, was performed by the System Development Corporation for the U.S. Office of Education, under Contract OE CO-70-3952. The project represents the third phase of a four-phase program developed by the Task Force in conjunction with its overall objective of reviewing and reporting upon the status of automation in Federal libraries, encouraging the development of compatible automation systems where feasible, furnishing guidance to Federal administrators and librarians on automation problems in libraries, and providing liaison between Federal libraries and other groups interested in the application of automatic data processing to information and document retrieval.

The first phase of the overall program was to appraise the current activities in library automation and identify major trends, areas of activity where automation might be most feasible, and techniques that might be most applicable. The work, based primarily on a literature review, was conducted by the National Bureau of Standards and was completed in 1967.[1] The second phase of the program involved a series of studies reporting on the history and development of selected Federal library automation projects,[2] with primary emphasis on administrative factors in libraries with automated systems.

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[1] National Bureau of Standards. "Summary Reconnaissance Paper on Trends Toward Automation Based on a Limited Analysis of the Literature." FLC Newsletter, March 1968.

[2] Information Dynamics Corporation, Bethesda, Maryland. Development Trends in Federal Library and Information Center Operation, June 1969.

The third phase of the program carried out by SDC had the following goals:

- study and define library operations which are susceptible to automation, both those now being automated in Federal and/or non-Federal libraries, and those not now automated or scheduled for automation
- survey and describe in meaningful terms, the current techniques of automation which, though possibly developed for other uses, are potentially useful in library applications
- establish criteria, to be used in making determinations as to feasibility, functions to be automated, types of hardware and software to be used, internal or external services, and extent of involvement with other systems.

Three major tasks were called for in this phase:

1. a survey of the entire Federal library community
2. the preparation of a handbook to educate and guide Federal librarians in automation feasibility and planning
3. the preparation of a report summarizing survey results, and automation findings, and presenting recommendations for phase four.

This report is submitted in fulfillment of Task 3, and it includes all of the findings from Task 1. A companion volume, entitled Handbook on Federal Library Library Automation, has been submitted in fulfillment of Task 2.[1] These two final products, together with interim reports and associated data, complete both the present project and the third phase of the Task Force's Federal library automation program.

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[1] The Handbook is scheduled for publication by the R. R. Bowker Company in early 1972.

CONDUCT OF THE WORK

The project began in June 1970 and was completed in July 1971. The SDC Project Team was composed of librarians, systems analysts, and survey specialists most of whom had extensive background and experience in library and information center operations, and particularly in the area of automation. The Project was directed by Mrs. Barbara Evans Markuson and work was performed by staff members of SDC's Education and Library Systems Department, under the general supervision of Dr. Carlos A. Cuadra, Manager of the Department.

Preliminary Studies and Preparations

The Project began with the identification and analysis of pertinent literature covering both previous Federal library automation work and library automation activities of interest to the Federal library community but not necessarily dealing with Federal library automation. Five specific areas of the literature were selected as the most valuable to the study: studies relating to standards; systems analysis and feasibility studies; reports on operational automated systems; studies of development and trends; and long-range planning studies. The survey and analysis of this literature provided one basis for the development of the library categories and functions in Tasks 2 and 3, and also provided inputs to the development of the two questionnaires.

The second major task was to identify the categories of information that were potentially useful for library automation analysis, e.g., nature and size of collection, types of services, and personnel and facilities resources. These categories were used in structuring both the general questionnaire and the automation questionnaire and in analyzing the subsequent data.

The third major task was to develop a detailed list of library functions that could serve as the basis for much of the project work. The results of this functional analysis were reflected in the questionnaire structure and in the analysis of questionnaire results and the development of automation guidelines. They enabled us to gain a more precise understanding of the present status of operational systems and to prepare guidelines for assessing the feasibility of library automation and for carrying out automation activity.

Development and Use of the Survey Instruments

The fourth major task was to develop and test the survey questionnaires. The questionnaire technique was chosen as the most cost-effective method of surveying the entire Federal Library community and obtaining the most accurate and comprehensive data possible relating to Federal libraries and their automation programs, without placing undue burden on the respondents.

A two-part questionnaire was developed. The first part of the questionnaire was used to gather background information on current library operations, identify ongoing automated systems, and provide information on the attitudes of Federal librarians toward issues in automation, network planning, centralization, and administration. Part two of the questionnaire was very detailed and pertained specifically to ongoing automation programs. It was sent only to those libraries that had indicated, in the first questionnaire, that they were involved in some type of automation activity. Drafts of both questionnaires were reviewed extensively by the Automation Task Force members and were submitted to selected Federal librarians who volunteered their personal time to pretest and critique the questionnaires. In most of these pretests, SDC Project Staff members personally interviewed the Federal library volunteer.

The first (general) questionnaire, with a cover letter from the Librarian of Congress (See Figure I-1), was sent out in December 1970 to 2104 librarians. The Roster of Federal Libraries[1] yielded a list of 2104 Federal libraries. Questionnaire 1 was sent to all the libraries on that list. In two instances, where the listing in the Roster actually referred to two separate libraries, additional questionnaires were requested. The total number of libraries surveyed using the general questionnaire was 2106. A second, followup questionnaire was sent to all librarians who failed to respond within the first month, in an effort to obtain the fullest participation possible. In addition, many individual letters and telephone calls were used to aid in helping the recipient judge whether or how he should respond. While some Federal librarians who were already overburdened took a rather dim view of this sizeable questionnaire, the great majority of respondents completed the full questionnaire and considered it a valuable way to express their views, needs, and concerns. The number of responses received was 1012. The number of libraries finally included in the data base was 964. Responses that could not be included in the data base are described in Table I-1.

Respondents who qualified for the automation survey were notified in advance through a letter from the Executive Secretary of the Federal Library Committee (See Figure I-2). The automation questionnaire, with an explanatory cover letter from the Project Director (See Figure I-3), was mailed to 133 libraries during March and April, 1971. Of the 91 libraries that responded, 59 actually had an operational or a definitely planned automation project. Thirty-two of the responses were not included in the analysis, for reasons shown in Table I-2.

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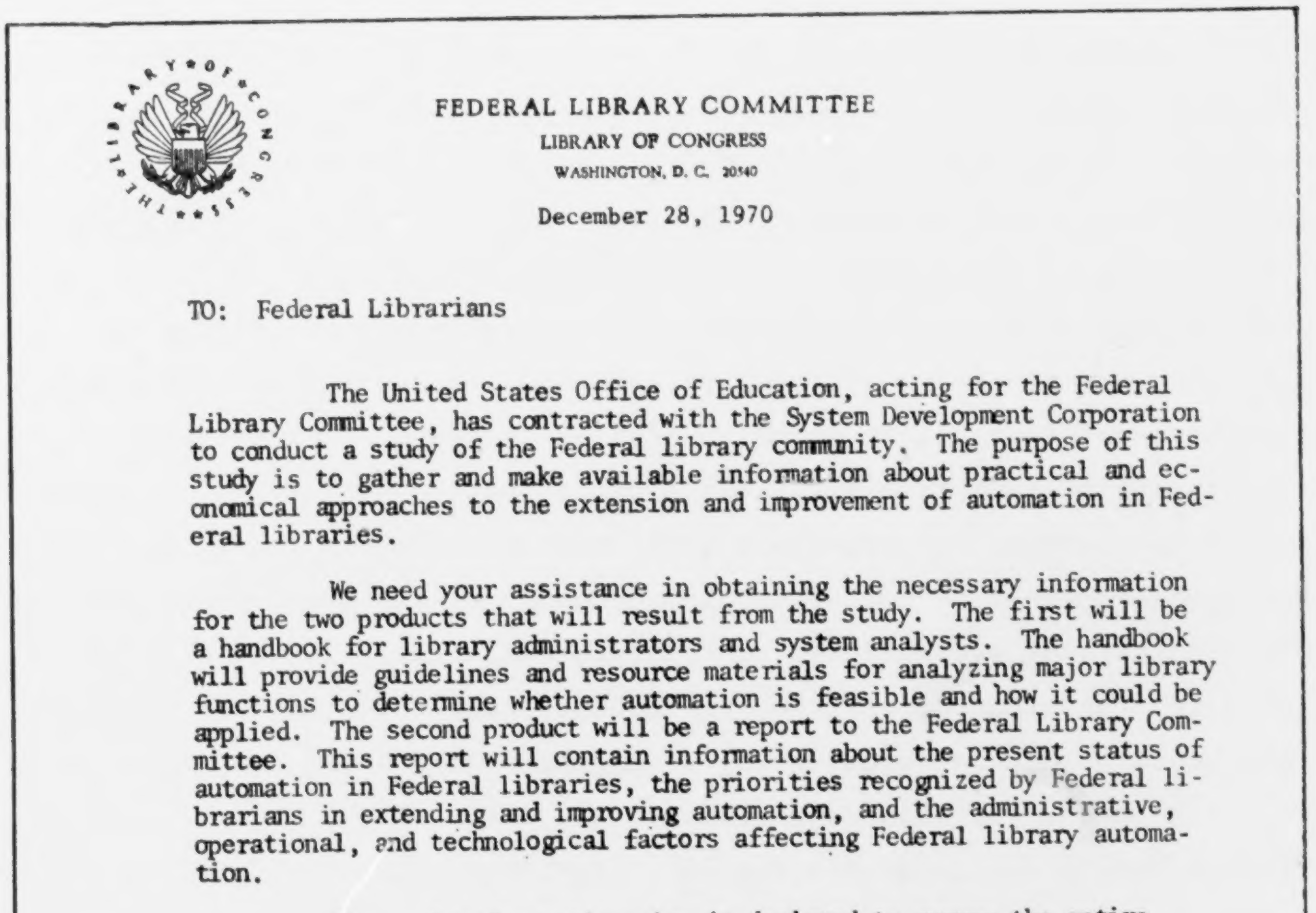
[1] Roster of Federal Libraries. Compiled by Mildred Benton and Singe Ottersen with funds provided by the ERIC Clearinghouse for Library and Information Science and with the support of the Federal Library Committee. Washington, D.C. The George Washington University Medical Center, Department of Medical and Public Affairs, Biological Sciences Communication Project. October, 1970. 282 p.



FEDERAL LIBRARY COMMITTEE
LIBRARY OF CONGRESS
WASHINGTON, D. C. 20540

December 28, 1970

TO: Federal Librarians

The United States Office of Education, acting for the Federal Library Committee, has contracted with the System Development Corporation to conduct a study of the Federal library community. The purpose of this study is to gather and make available information about practical and economical approaches to the extension and improvement of automation in Federal libraries.

We need your assistance in obtaining the necessary information for the two products that will result from the study. The first will be a handbook for library administrators and system analysts. The handbook will provide guidelines and resource materials for analyzing major library functions to determine whether automation is feasible and how it could be applied. The second product will be a report to the Federal Library Committee. This report will contain information about the present status of automation in Federal libraries, the priorities recognized by Federal librarians in extending and improving automation, and the administrative, operational, and technological factors affecting Federal library automation.

The enclosed questionnaire is designed to survey the entire Federal library community, identifying the functions they perform, the operational areas in which automation might be most helpful, and the libraries that have an automation program under way. Even if your library is not automated, your help in providing information to the Federal Library Committee and other Federal librarians is vitally needed.

The handbook and report resulting from this study will provide reliable and useful information that would not otherwise be available. Your participation is indispensable to achieving the hoped-for results, and will therefore be greatly appreciated.

Sincerely yours,

L Quincy Mumford

L. Quincy Mumford
Chairman
Federal Library Committee

Enclosure

PERMANENT MEMBERSHIP—Library of Congress (Librarian of Congress, Chairman), National Agricultural Library, National Library of Medicine, Department of State, Department of the Treasury, Department of Defense, Department of Justice, Post Office Department, Department of the Interior, Department of Commerce, Department of Labor, Department of Health, Education, and Welfare, Department of Housing and Urban Development, Department of Transportation.

ROTATING MEMBERSHIP, 1969–71—Atomic Energy Commission, National Aeronautics and Space Administration, National Science Foundation, Smithsonian Institution, Supreme Court of the United States, Veterans Administration.

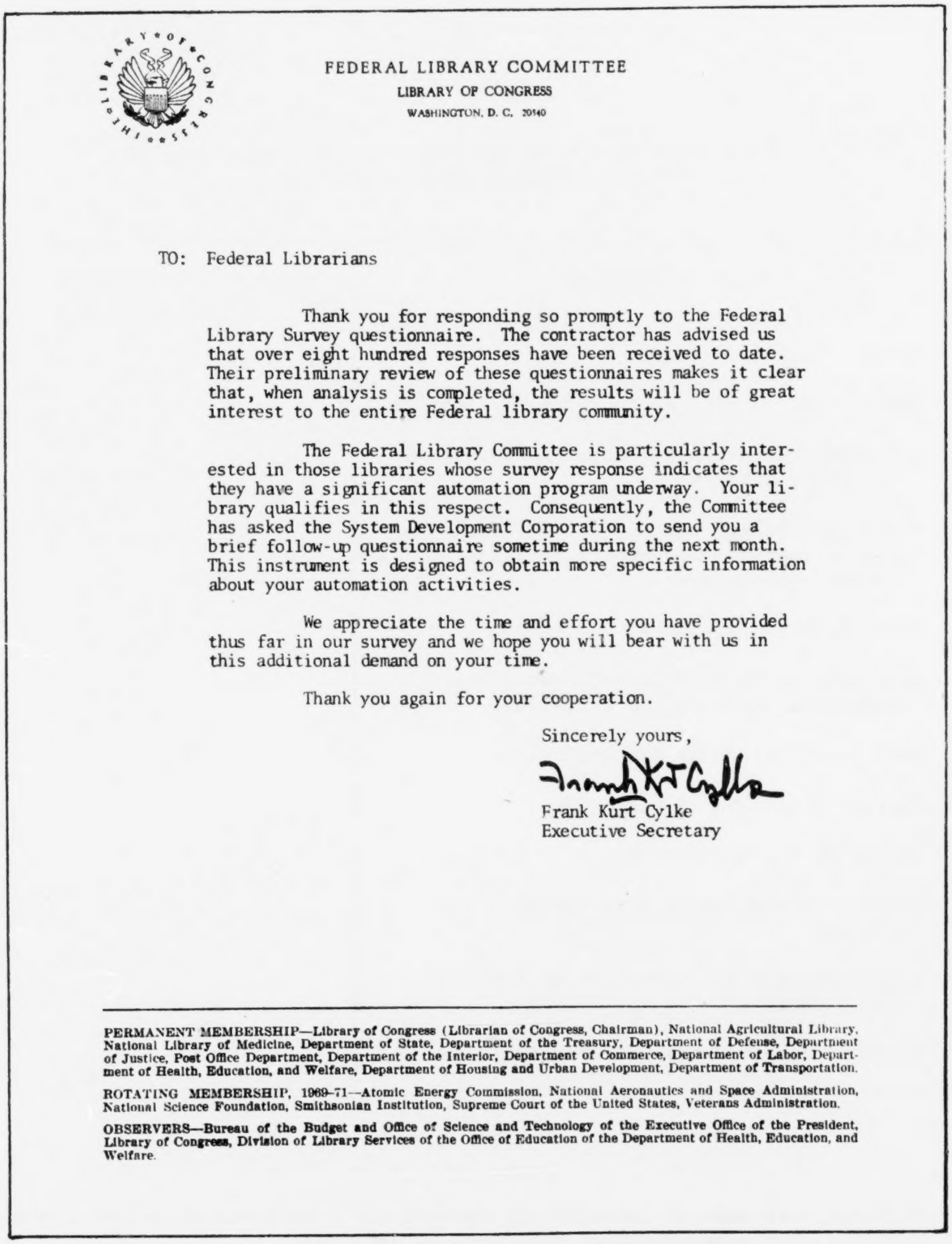
OBSERVERS—Bureau of the Budget and Office of Science and Technology of the Executive Office of the President, Library of Congress, Division of Library Services of the Office of Education of the Department of Health, Education, and Welfare.

Figure I-1. Cover Letter for General Questionnaire

TABLE I-1. RESPONSES TO QUESTIONNAIRE 1 THAT WERE NOT INCLUDED IN THE DATA BASE

Type of Response	Number of Respondents
Library facility closed	53
Library merged with another Federal Library	17
Respondent is a central supervisory office, but not a library	14
Respondent judged not to be a library (these were primarily very small laboratory or office collections)	30
Respondent not a Federal agency	5
Returned due to improper address (some addresses could not be verified)*	11
Data too brief to be meaningful	14
Library destroyed by earthquake	1
Status of library unknown	2
Respondent considered questionnaire too complex	1
Respondent did not have time to complete questionnaire	6
Response received too late for inclusion	51

*Efforts were made to identify and forward the questionnaire to the proper address, but some addresses could not be verified.



FEDERAL LIBRARY COMMITTEE
LIBRARY OF CONGRESS
WASHINGTON, D. C. 20540

TO: Federal Librarians

Thank you for responding so promptly to the Federal Library Survey questionnaire. The contractor has advised us that over eight hundred responses have been received to date. Their preliminary review of these questionnaires makes it clear that, when analysis is completed, the results will be of great interest to the entire Federal library community.

The Federal Library Committee is particularly interested in those libraries whose survey response indicates that they have a significant automation program underway. Your library qualifies in this respect. Consequently, the Committee has asked the System Development Corporation to send you a brief follow-up questionnaire sometime during the next month. This instrument is designed to obtain more specific information about your automation activities.

We appreciate the time and effort you have provided thus far in our survey and we hope you will bear with us in this additional demand on your time.

Thank you again for your cooperation.

Sincerely yours,

Frank Kurt Cylke

Frank Kurt Cylke
Executive Secretary

PERMANENT MEMBERSHIP—Library of Congress (Librarian of Congress, Chairman), National Agricultural Library, National Library of Medicine, Department of State, Department of the Treasury, Department of Defense, Department of Justice, Post Office Department, Department of the Interior, Department of Commerce, Department of Labor, Department of Health, Education, and Welfare, Department of Housing and Urban Development, Department of Transportation.

ROTATING MEMBERSHIP, 1969–71—Atomic Energy Commission, National Aeronautics and Space Administration, National Science Foundation, Smithsonian Institution, Supreme Court of the United States, Veterans Administration.

OBSERVERS—Bureau of the Budget and Office of Science and Technology of the Executive Office of the President, Library of Congress, Division of Library Services of the Office of Education of the Department of Health, Education, and Welfare.

Figure I-2. Advance Letter for Automation Questionnaire

TABLE I-2. RESPONSES TO QUESTIONNAIRE 2

Response	Number of Respondents
Automated projects definitely planned or operational	59
Automated projects in preliminary planning stage; no details available	8
Use automated systems maintained elsewhere	9
No automation planned; misunderstood question in Q1	15

Data Preparation and Analysis

The SDC project team examined each returned general questionnaire to determine its suitability for analysis.[1] Many questionnaires were not filled out adequately and consequently could not be included in the data base. Some agencies identified as libraries in the Roster actually function as central administrative offices, rather than as libraries; their responses were therefore excluded from the data base. In several instances, it was discovered that two libraries listed separately in the Roster of Federal Libraries functioned in every respect as one library. Where two sets of responses were received and were identical, we entered them in the data base only once.

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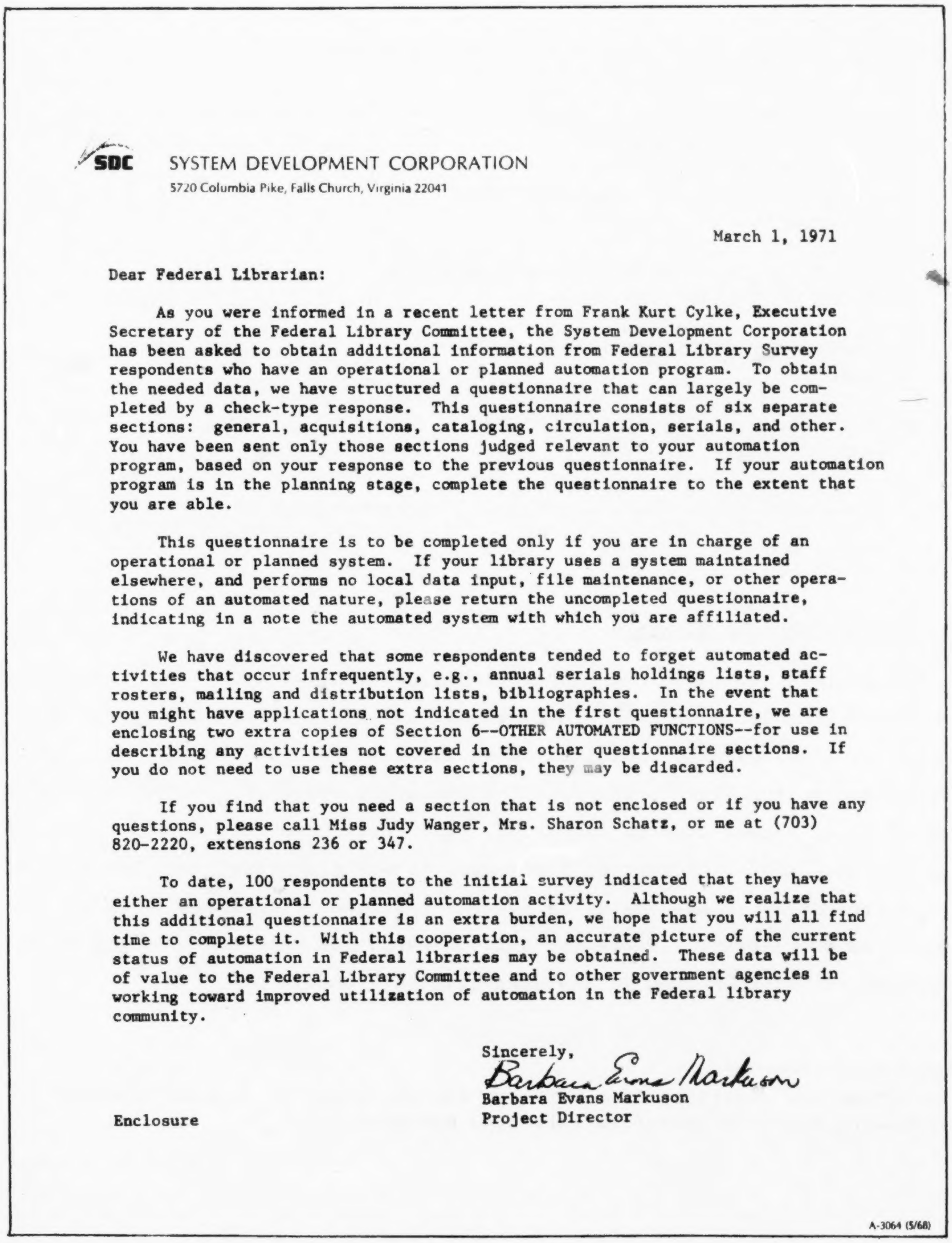
[1] The automation questionnaires were too few in number to warrant computer processing and were therefore tabulated manually.



SDC SYSTEM DEVELOPMENT CORPORATION
5720 Columbia Pike, Falls Church, Virginia 22041

March 1, 1971

Dear Federal Librarian:

As you were informed in a recent letter from Frank Kurt Cylke, Executive Secretary of the Federal Library Committee, the System Development Corporation has been asked to obtain additional information from Federal Library Survey respondents who have an operational or planned automation program. To obtain the needed data, we have structured a questionnaire that can largely be completed by a check-type response. This questionnaire consists of six separate sections: general, acquisitions, cataloging, circulation, serials, and other. You have been sent only those sections judged relevant to your automation program, based on your response to the previous questionnaire. If your automation program is in the planning stage, complete the questionnaire to the extent that you are able.

This questionnaire is to be completed only if you are in charge of an operational or planned system. If your library uses a system maintained elsewhere, and performs no local data input, file maintenance, or other operations of an automated nature, please return the uncompleted questionnaire, indicating in a note the automated system with which you are affiliated.

We have discovered that some respondents tended to forget automated activities that occur infrequently, e.g., annual serials holdings lists, staff rosters, mailing and distribution lists, bibliographies. In the event that you might have applications not indicated in the first questionnaire, we are enclosing two extra copies of Section 6--OTHER AUTOMATED FUNCTIONS--for use in describing any activities not covered in the other questionnaire sections. If you do not need to use these extra sections, they may be discarded.

If you find that you need a section that is not enclosed or if you have any questions, please call Miss Judy Wanger, Mrs. Sharon Schatz, or me at (703) 820-2220, extensions 236 or 347.

To date, 100 respondents to the initial survey indicated that they have either an operational or planned automation activity. Although we realize that this additional questionnaire is an extra burden, we hope that you will all find time to complete it. With this cooperation, an accurate picture of the current status of automation in Federal libraries may be obtained. These data will be of value to the Federal Library Committee and to other government agencies in working toward improved utilization of automation in the Federal library community.

Sincerely,

Barbara Evans Markuson

Barbara Evans Markuson
Project Director

Enclosure

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Figure I-3. Cover Letter for Automation Questionnaire

During the screening process, the Project Team carefully examined each general questionnaire and prepared it for keyboarding. This involved performing internal checks for consistency of response, coding various ranking questions to indicate whether the respondent ranked, rated, or merely checked the answer, and adding codes for geographical location.

Four Viatron key-to-tape machines were used to transcribe the questionnaire data to machine-readable form. These machines are particularly well suited for questionnaire data, since they have a CRT display for data verification, allow for automatic right justification of numeric fields, and permit the use of control programs similar to those available on keypunch machines. After the data were verified, they were output to a cassette tape for subsequent input to the computer.

All records were sorted into numeric order by questionnaire and card number and were listed with a program that also checked for the occurrence of missing cards or data parities. Any necessary corrections were input either on cards or on a Viatron tape, and were then run through a special editing program to produce a corrected file of questionnaire data. As an output of this correction step, a listing was produced that contained sorted values for each numeric data element to be used to obtain quartile and median values.

After experimenting with the initial set of data obtained from the earliest responses, the decision was made to use SDC's general purpose Commercial Data Management System (CDMS) to generate and analyze the data base resulting from the questionnaire. Two special programs were written to provide for the kinds of tabulations desired by the project staff and the Task Force. CDMS was found to be quite satisfactory for handling the data reduction and for permitting on-line examination of the data elements, say, for a specific respondent, when this was required to verify range and quartile points for some of the numeric data.

As indicated earlier, the automation questionnaires were tabulated manually. In addition to the tabulation, a system description was prepared for each responding library that had at least one operational application. To ensure maximum accuracy in our interpretation of each library's response, a draft of each description was submitted, with a cover letter, to the appropriate library respondent for any necessary revision and amplification. We also carried out extensive telephone follow-up to clarify ambiguous responses and help ensure that our interpretations were correct. The cooperation and patience of the respondents were extraordinary, and made it possible for us to provide the most detailed analysis of Federal library automation ever undertaken.

System profile charts were constructed for each major application, and indexes were made to provide access to system features of major interest. These indexes and charts, together with the system descriptions, are presented in the Handbook on Federal Library Automation, since we believed that they would be most useful there. However, the present report describes particular highlights of the automated systems where they are relevant to the discussion.

Representativeness of the Sample

The Roster of Federal Libraries (the most extensive list of Federal libraries) identifies 2104 libraries exclusive of the national libraries, and three quasi-official libraries (e.g., the American National Red Cross Library). Survey results indicated, however, that at least 130 of the library listings are now invalid. These include 53 libraries that have closed, 17 that have merged with other Federal libraries, 14 that are central offices and not libraries, 30 that are not really libraries at all, 5 that did not consider themselves Federal agencies, and 11 whose addresses could not be determined. In addition, some libraries that are listed once in the Roster are actually two separate libraries, while in other cases, two separate listings were found to refer to the same library facility.[1] Some questionnaires were returned with insufficient data to be included in the data base; others were returned too late to be included. The data base used in the study included information from 964 respondents.

How representative of the Federal library community are these 964 libraries? Several comparisons of the nonrespondent group with the Federal library community as a whole are listed below:

- Approximately 67 percent of the nonrespondents were foreign libraries; foreign libraries constitute about 40 percent of the total listings in the Roster.
- About 6.5 percent of the nonrespondents were libraries in the Metropolitan Washington area. About 7 percent of the listings in the Roster are located in the Washington area.
- Almost 14 percent (142) of the nonrespondents were overseas dependent schools, such libraries comprise 15.7 percent of the libraries listed in the Roster.
- 75 percent of the nonrespondents (761) were Department of Defense Libraries; about 66 percent of the total population listed in the Roster are DOD libraries.

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[1] These comments are not meant to be critical of the Roster; they illustrate the dynamic nature of the Federal library system.

- Less than 2 percent (3 out of 136) of the USIA libraries responded; USIA libraries account for about 13 percent of the Roster listings. (The low response is thought to be due to language difficulties and to the fact that most of these libraries are staffed by nonprofessionals. Selected data for USIA libraries were obtained from the USIA Headquarters Library for inclusion in this report.)

For agencies other than those listed above, the data base includes about 70 percent of the Department of the Interior libraries, about 40 percent of the Department of Commerce libraries, about 60 percent of the Department of Health, Education, and Welfare libraries, and about 76 percent of the Veterans Administration libraries.

From these various aspects, it appears that the data base is largely representative, but that the smaller overseas libraries are not represented in proportion to their number. If these libraries had been included, some of the data on budgets, staffing, and holdings might well have reflected a more serious situation than is shown in this report.

ORGANIZATION OF THIS REPORT

Two major reports were prepared as final products of the present study. One is the Handbook on Federal Library Automation, addressed primarily to those persons who are or may be directly concerned with the planning and implementation of library automation programs. It draws on data from both questionnaires, particularly the automation questionnaire, and also on the automation literature, site visits, and the experience of the SDC project staff.

This report is addressed primarily to the Federal Library Committee and to administrators and others in the Federal government who may have management responsibility for the formulation and implementation of plans for continued and improved Federal library service. It is based largely on the findings from the two questionnaires--the general questionnaire and the automation questionnaire--and on the interpretation of the findings by the SDC project team. Chapter II is a Summary of the major findings, conclusions, and recommendations. Chapter III reviews the status of Federal library automation, based on the findings from the automation survey. Chapter IV describes and discusses a number of important aspects of the Federal library community that were explored through the general questionnaire. A complete tabulation of the data from the general questionnaire is provided in the Appendix, with the response data matched to the questions as they appeared in the questionnaire.

Chapter V of this report discusses the implications of the entire study for Federal library automation and evaluates possible alternative courses of action. The final chapter presents our conclusions and recommendations.

CHAPTER II. SUMMARY

PURPOSE AND SCOPE OF STUDY

This report describes the findings of one of the most intensive investigations of the Federal library community ever undertaken. The study, initiated by the Federal Library Committee's Task Force on Library Automation, was performed by System Development Corporation under contract to the U.S. Office of Education and represents the third phase of a four-phase Task Force program. The objectives were to:

- Identify library operations susceptible to automation.
- Survey the status of automation, particularly in Federal libraries.
- Develop guidelines on automation planning for Federal librarians and recommendations for the next phase of the Task Force program.

The project began in June 1970 and was completed in July 1971. It involved a survey of 2104 Federal libraries (excluding the national libraries) and resulted in two major products: the Handbook on Federal Library Automation and this report. From the 2104 libraries surveyed, 964 usable responses were received.

STATUS OF THE FEDERAL LIBRARY COMMUNITY

All Federal libraries were surveyed to obtain data on resources, management, operational characteristics and problems, attitudes toward automation, and potential for automation. Findings showed that:

- The Federal library community is widely dispersed: only 7 percent of the libraries are located in Washington, D.C., and only 60 percent are in the continental U.S.
- The vast majority of the libraries are small or medium sized and have fewer than three staff members; 302 out of 964 responding libraries have only one staff member.

- Sixty percent of the respondents described their libraries as special or technical. However, many Federal libraries serve the "forgotten publics" classed by the government itself as disadvantaged, e.g., Indian children and other minority groups, and handicapped and institutionalized persons. In addition, kindergarten children, foreign nationals, students, and the general public are served.
- The Federal librarians hold a strong positive attitude toward library automation; nevertheless, they do not rate automation per se above such critical needs as better budgeting, increased staff and space, and improved user services.
- To augment local collections, more than 250 respondents access machine readable data bases by mail, on-line terminals, and local computer facilities.
- The overwhelming majority of respondents reported that local resources are inadequate to support automation, and they are very much in favor of the idea of centralized automation support and services.

STATUS OF FEDERAL LIBRARY AUTOMATION

To obtain detailed technical and management information, a six-part questionnaire was sent to Federal libraries initially identified as engaged in automation activities. Thus, for the first time in any library community, information is now available describing the applications, equipment, data bases, documentation, and future plans of each automated library. The findings showed that:

- Only a few of the 2104 Federal libraries have attempted to automate: a total of 59 libraries reported operational and planned systems.
- Most of the automation efforts have been in comparatively large and well-supported libraries.
- Most of the libraries with automation programs have addressed more than one library function: the 59 libraries reported a total of 115 operational systems.

- Automation has occurred primarily in cataloging, serials control, and such reference services as selective dissemination, information retrieval, and production of bibliographies.
- Most automation projects were accomplished through cooperation between the library and local agency staff, and used local agency equipment.
- Use of existing library and information standards was very infrequent; most systems were developed without reference to other automated systems--Federal or otherwise--and very few have ever been described, in print or in oral communication, to either the Federal or non-Federal library community.

FUTURE OF FEDERAL LIBRARY AUTOMATION

To date, automation has had little impact on the total Federal library community. Benefits have largely been restricted to a few well-supported libraries and their clientele. If all users of Federal libraries are to be served adequately, much greater attention must be given to the growing needs and problems of the deprived libraries.

Since it has cost considerable money and effort to provide automation (or partial automation) to only 3 percent of the Federal libraries, it is clear that independent automation for the entire community would be extremely expensive. Although it is clear that Federal libraries can substantially improve service through automation, it is equally clear that funds to support Federal library automation are not unlimited. The challenge, then, is to provide the benefits of automation without expensive, duplicative effort.

While it is tempting to consider a truly unified Federal library network, numerous technical and administrative difficulties militate against the success of this approach at this time. More limited--yet highly productive--efforts should be undertaken to provide the foundation for greater standardization and integration. The Federal library community supports these objectives, as evidenced by survey respondents' decided preference for centralized automation planning, centralized automated Federal library networks or service centers, and standardized program packages for use in Federal libraries. Support of a stronger role for the Federal Library Committee in library automation planning was also voiced.

CONCLUSIONS AND RECOMMENDATIONS

Development and introduction of automation for the nonautomated Federal libraries should not follow the independent, do-it-yourself approach that has characterized most automation efforts to date: instead, the emphasis should shift toward centralized automation planning and toward the development of standardized system specifications, standardized program packages, and central or regional computer-based service centers. We therefore believe that the next phase of the Task Force's work should be addressed to five major objectives:

1. Development of generalized system components
2. Selective development of centralized services
3. Extension of service to the forgotten publics
4. Accelerated development of standards
5. Development of effective library communications mechanisms

The first and second objectives represent a major new thrust in Federal library automation. We believe that these provide the only cost-effective means of applying computers to the problems of Federal libraries, without exorbitant cost. The service center concept is particularly promising: it has proven to be highly cost-effective in a variety of applications, and offers a means of improving service, efficiency, and morale in the hundreds of Federal libraries that are too small for local automation.

Our recommended program stresses the use of MARC and other data bases already developed and supported by the Federal government and/or private industry. These tools can be used in a variety of ways in the three areas identified by this survey for initial attention: reference support systems, acquisitions support systems, and cataloging support systems. The program should also be founded on other existing achievements in the Federal library and information community, including the NASA, ERIC, and NLM-MEDLARS systems, as well as the standards and communications activities of the Federal Library Committee.

The history of national information system planning indicates that status reports on information activities age quickly, and that unless action follows planning, a need develops for new status reports. We believe that work on the proposed program should be initiated without delay, to take advantage of the impetus provided by this report and of the currency of its findings. Millions of dollars have been spent over the past few years to improve service in public, school, and college and university libraries, and many large-scale automation projects have been supported by Federal funds. These projects can be viewed as an expression of Government interest in the status of our Nation's libraries. The time has come for the Federal Government to give greater attention to the state of its own libraries, through programs designed to make Federal libraries capable of assuming a more effective role in the Federal process.

CHAPTER III. STATUS OF FEDERAL LIBRARY AUTOMATION

INTRODUCTION

Fifty-nine automated Federal libraries contributed significantly to the success of this survey.[1] Not only did they complete the general survey questionnaire, which served to identify them as automated libraries, but they also provided responses to a subsequent six-part, in-depth automation questionnaire which was followed by additional letters and telephone calls. In addition, most of these respondents took the time to assemble illustrative computer printouts, sample forms, and other project documentation; indeed, most of the illustrations in the Handbook on Federal Library Automation are derived from this source. These libraries were asked to verify the accuracy of the system descriptions prepared by the SDC Project Staff (see example in Figure III-1). Throughout the entire project, their cooperation was outstanding, with the result that the Federal library community now has available the most accurate and detailed survey of automation ever made for any library group.

The information gathered about these libraries is used in both this report and the Handbook on Federal Library Automation. This report includes the data derived from the two questionnaire surveys; the Handbook includes a brief summary of the survey data and detailed system descriptions for each library with at least one operational system. The reader will find these system descriptions useful for describing the scope of each library's automation program by major functional area, a description of the equipment used, and a brief note on program language and system documentation. The descriptions (see sample provided in Figure III-1) are also useful in identifying specific Federal library personnel with automation experience in various applications.

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[1] One response was received too late to be included in the data analysis, but a system description was prepared.

SMITHSONIAN INSTITUTION GENERAL LIBRARY SYSTEM
Natural History Building
10th Street and Constitution
Washington, D.C.

Telephone: (202) 381-5074

Contact:

Bibliographical details: Jack Marquardt, Head, Reference Department.

Technical details: James Crockett.

Applications:

(1) Acquisitions--operational since September, 1965

System Description: This system includes the following operations: prepares order forms from machine-readable input, automatically assigns order to appropriate vendors, provides listings of all items on order, maintains fund encumbrancing and accounting for all purchases, maintains status information on items on order or received, produces control cards for use in check-in of items and updating status through technical processing cycle, and outputs bibliographic data from order records for use in cataloging.

The system handles orders for which payment is required in advance, as well as orders billed with the shipment. Subscription renewals for journals also handled automatically. Statistical analyses are made of vendor performance and the acquisitions activity. Outstanding order and in-process files can be searched on several data fields.

All purchased items are handled through this system; this amounts to about 6,000 titles annually and includes orders submitted by four other libraries that are part of the Smithsonian system. Purchase requests for all types of materials--monographs, technical reports, government documents, serials, microforms--are included. The purchase requests are converted to machine-readable form by library staff members; the input device is a keypunch.

Equipment: Honeywell 1250 computer (local agency computer), IBM 029 keypunch (2), IBM 083 sorter, Honeywell 204B-8 7-track tape drives (6), Honeywell 259 magnetic disc drive with 1 disc pack per drive (2), Honeywell 222/4 line printer.

Approximately 12 hours of computer time are used per month.

Figure III-1. Sample System Description for Respondents With Operational Programs (Sheet 1 of 2)

SMITHSONIAN INSTITUTION GENERAL LIBRARY SYSTEM

Programs: The programs are written in COBOL.

Documentation: System design specifications, program design specifications, operator's manual, user's manual, documentation of system modifications.

(2) Serials--operational, but still in testing stage.

System Description: This system is restricted to serials acquired through purchase. It provides fund accounting for serials, subscription renewal control, printed renewal lists for agency staff review, maintenance of vendor or source address file, orders to vendors, listings of serial titles (without holdings statement), and special listings of serial titles by subject, language, etc. Cross references to serial titles, and library membership lists are maintained.

The Library currently receives 2,773 serial titles and sends out 2,361 subscription renewals annually. The automated system includes periodicals, newspapers, annuals, works issued in frequent editions, and sets in progress.

The input record is a rather complete bibliographical description, e.g., similar to the LC catalog card record. Records can be retrieved from the data base by field, e.g., dealer.

A printed "Serials Purchase Master File," which includes titles purchased by five libraries, is updated weekly. Two copies of the listing are printed.

Equipment: [Same as in "1" above.] This system requires approximately three hours of computer time per month.

Programs: The program is written in COBOL.

Documentation: [Same as in "1" above.]

Future Plans: To expand system to include gift and exchange materials.

Figure III-1. Sample System Description for Respondents With Operational Programs (Sheet 2 of 2)

The remainder of this section discusses the automation questionnaire and the interpretation of questionnaire data. Subsequent sections in this chapter present an overview of automated Federal libraries, the major functional areas in which operational automation projects were identified, and the general findings related to automation project management.

Automation Questionnaire

The second questionnaire of the SDC survey was structured to permit in-depth exploration of both the general experiences of the Federal librarians in developing their automated systems and the detailed aspects of the automation of specific library functions. The six sections of the questionnaire were: General, Acquisitions, Cataloging, Circulation, Serials, and Other Automated Functions. The first section, completed by all respondents, focused on the experiences of the respondents in introducing automation in their libraries; the other sections focused on particular application areas. The libraries received only those sections for which they reported automated programs.

Each of the sections in the automation questionnaire contained structured questions uniquely applicable to the function under examination. In addition, questions on bibliographic and user services and management, automation development, and technical features appeared in all four sections. Some of these data are presented in the next section of this chapter; others are presented by function in a later section. The final section of the automation questionnaire (6. Other Automated Functions) used a free-response format which permitted the respondents to describe automated projects for other library applications according to the outline provided (e.g., subject areas covered, materials handled, major data inputs, level and type of indexing, equipment used, major computer operations, and products or services).

Interpretation of the Data

These findings from the automation questionnaire should be considered as indications of trends and patterns, and not as highly reliable quantifications of the status of Federal library automation. The tallies, for example, do not reflect later information obtained by the SDC staff from follow-up contact with the respondents in preparing the system descriptions. From these contacts, it was evident that changes were occurring in the systems during the period between completion of the questionnaire and our follow-up correspondence. One of the strongest indications of the dynamic nature of Federal library automation is the number of systems reportedly in some state of transition at the time of this writing: several systems are being expanded (e.g., to handle more types of materials), several programs are being partially or completely rewritten, and some contractor-run systems are being converted to internally managed systems. This dynamic status is further illustrated and amplified in the following sections.

OVERVIEW OF AUTOMATED FEDERAL LIBRARIES

The tables in this section reflect some of the general characteristics and environment of the automated community of Federal libraries. Supporting data from the general questionnaire are also provided, where appropriate.

General Characteristics and Resources

Table III-1 identifies the automated libraries by location, agency, and type of library. Although the Washington, D.C. metropolitan area is the locus of the largest single group of automated libraries--19, this number still represents only one-third of the U.S.-based libraries reporting automation activities. The single foreign-based automated library is a U.S. Air Force dependents school media center in Japan, serving 30 schools.

Over one-half (57 percent) of the current automation activity is occurring in DOD libraries. Proportionately, however, these 33 libraries are only 2 percent of the total 1411 DOD libraries.[1] In contrast, the 5 automated U.S. Atomic Energy Commission libraries represent about 38 percent of the 13 libraries in the AEC.

In the general questionnaire, each respondent was asked to indicate the type of library their library most nearly approximated. Clearly, the majority of automated libraries are technical-type libraries. It should be noted, however, that three of the technical libraries indicated they were serving dual roles: technical/college; technical/public; and technical/archival or depository.

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[1] This total figure is based on the number of Department of Defense libraries identified in the Roster of Federal Libraries.

TABLE III-1. GENERAL CHARACTERISTICS OF AUTOMATED LIBRARIES

1. LOCATIONS

U.S.-Based (57)

California	4	Mississippi	1	Oregon	1	Japan	1
Colorado	4	Missouri	3	Pennsylvania	1		
Florida	1	New Mexico	1	Rhode Island	1		
Georgia	1	New Jersey	1	South Carolina	1		
Kansas	1	New York	2	Tennessee	3		
Illinois	1	North Carolina	1	Texas	1		
Maryland	1	North Dakota	1	Virginia	3		
Massachusetts	2	Oklahoma	2	Washington, D.C. Metropolitan area	19		

Foreign-Based (1)

2. AGENCIES

Executive Branch

Executive Office of the President

Office of Economic Opportunity	1

Executive Departments

Agriculture	1
Commerce	1
Defense	2
Air Force	4
Army	14
Navy	13
Health, Education, and Welfare	4
Housing and Urban Development	1
Interior	5
Transportation	1

Independent Agencies

Smithsonian Institution	1
Atomic Energy Commission	5
Civil Service Commission	1
Federal Deposit Insurance Corporation	1
National Aeronautics and Space Administration	2
Tennessee Valley Authority	1

3. TYPE OF LIBRARY

Technical, special (including medical) or research library	51
College or university library	4
Public, general reading or recreation library	2
School (elementary or secondary) library	1

Number and Types of Applications

The types of applications that have been automated by the 58 libraries are identified in Table III-2. These data report findings only for those libraries with at least one operational system. No data are listed for respondents who have plans but are not yet operational for any function, since it was impossible to determine how firm the planning actually was.

TABLE III-2. AUTOMATED FUNCTIONS BY NUMBER OF LIBRARIES AND BY NUMBER OF OPERATIONAL SYSTEMS

Applications	**Number of Libraries Reporting Projects**	Number of Operational Systems
Acquisitions	10	7
Cataloging	32	27
Circulation	18	13
Serials	31	25
Information Retrieval	18	14
Bibliographic Publications	13	10
Selective Dissemination of Information	12	7
Abstracting and Indexing	4	3
Indexes to Special Collections	9	6
Others	3	3

It is interesting to note the emphasis in these projects on systems related to user services. For example, many of the cataloging systems include book catalogs, new book lists, and specialized indexes; the serials systems emphasize serial holdings lists for distribution to user groups; and the selective dissemination of bibliographic publications are user-oriented. This emphasis may account for the relatively low overall proportion of acquisitions systems, which, by and large, benefit the library more than its users.

The data shown in Table III-3 indicate that none of these libraries have resources comparable to large public and university libraries; however, they are among the most advantaged Federal libraries. The fact that one-fourth of the automated libraries have total budgets of less than $75,000, only one professional librarian, and less than 37,700 total holdings indicates that automation is not closed to small libraries, even though the systems may be less sophisticated than those in the larger libraries.

One-half of the libraries reported automation of 1 or 2 applications; at the extreme end of the range, 2 libraries reported 6 and 7. For example, the Argonne National Laboratory Library Services Department (U.S. Atomic Energy Commission) in Illinois has automated 7 functions: circulation of technical reports; serials control, including the production of the union list of serials for the Associated Colleges of the Midwest; acquisitions for about 5600 titles, including monographs, technical reports, government documents, and microforms; cataloging in which catalog cards and bookform catalogs are produced for technical reports and monographs; SDI for 500 profiles, with weekly batch searches of Chemical Abstracts and Nuclear Science Abstracts; publication of bibliographic accessions lists; and production of labels for distribution. All 7 applications are operational.

System Development

Figure III-2 shows the automation activity in Federal libraries by the year in which automation projects achieved operational status. (Not all respondents provided a start-up date, but the chart provides a general picture of trends.) In addition, the chart shows an upward trend in automation, but the activity rate from 1960 to 1961-65 seems to have leveled off between 1966 and 1970. In addition, several projects were reported in a preoperational status; presumably, most or all of these will reach operational status within the next 5 years.

TABLE III-3. **RESOURCES**

BUDGET (Total for 56 libraries: $18,792,584)

Median	$176,500
1st Quartile	74,500
3rd Quartile	464,000
Range	$10,000-1,765,000

STAFF

	Median	1st Quartile	3rd Quartile	Range
Professional				
1410 [N=53]	4.0	1.0	9.0	1-53
1412 [N=14]	2.0	1.0	3.5	1-4
Other [N=43]	2.0	1.5	5.5	1-57
Subprofessional [N=43]	6.0	3.0	10.6	1-46
Clerical [N=36]	4.0	2.0	7.0	.5-33

HOLDINGS

	Median	1st Quartile	3rd Quartile	Range
Total Collections [N=56]	150,000	37,700	367,000	2500-750,000
Estimated Percent in Microform [N=42]	5%	1%	25%	1%-80%

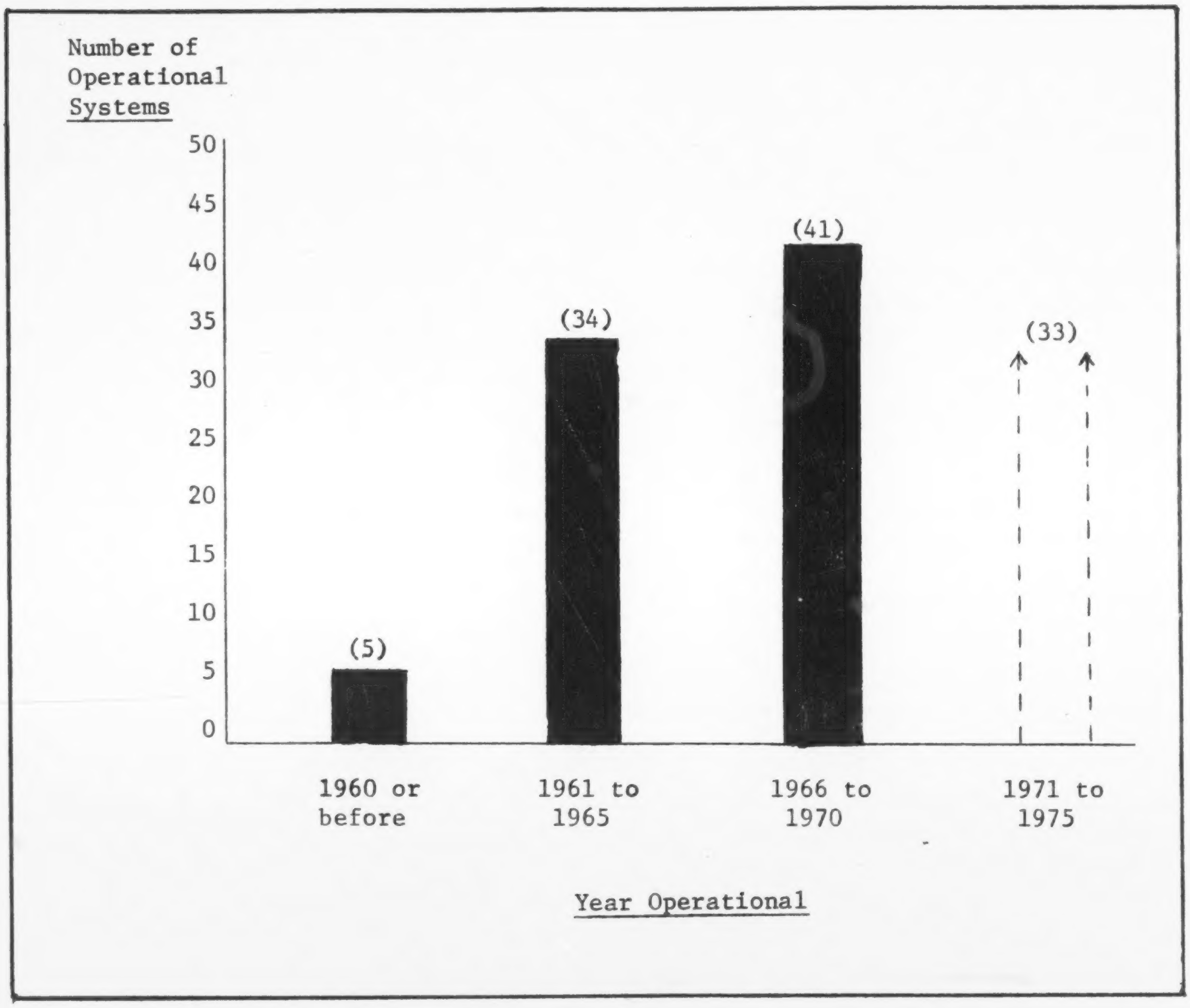

Figure III-2. Time Chart for Operational Federal Library Automated Systems

To date, there has been little cooperative development of automation projects. As shown in Table III-4, most of the systems reported were developed to meet only the library's own local requirements.

TABLE III-4. DEVELOPMENT OF SPECIFICATIONS BY NUMBER OF AUTOMATED LIBRARIES AND TYPE OF APPLICATION

Specifications for This System Were Developed:	Acquisitions	Cataloging	Circulation	Serials
To meet my library's requirements only	11	19	17	19
To meet requirements specified by my local or parent agency	0	4	1	1
To meet the requirements of some other government agency	0	0	0	0
To meet the requirements of one or more libraries, but not as a joint effort	0	2	0	4
As a joint effort with one or more other Federal or non-Federal libraries	0	0	0	1

The serials system that was developed to meet joint requirements with other Federal Libraries is a part of the U.S. Department of Interior's union list of serials project. Although this table reports cooperative development prior to system development, a few other types of cooperation were reported. An example of this is the cooperation between the National Institutes of Health Library and the Washington University (St. Louis) Medical School Library whereby the NIH Library is installing UW's operational serials control system.

Table III-5 clearly shows that most of these systems are stand-alone projects. In more recent systems, however, there is a trend toward integration of modules into a comprehensive system. Furthermore, in communications with some librarians about these projects, it was revealed that some systems initially conceived as stand-alone systems are now being viewed as modules that will fit into a broader system. In some cases, this after-the-fact integration will require system modifications. The study reveals that automation of one application usually leads to automation of other applications and, as the system becomes more inclusive, integration of some of the earlier projects becomes necessary.

TABLE III-5. COMPREHENSIVENESS OF SYSTEM DESIGN

System Developed	Acquisitions	Cataloging	Circulation	Serials
As part of an existing comprehensive automated system for this library	0	1	1	0
As part of planned comprehensive system	8	7	5	6
As a stand-alone system	3	13	9	15

This experience is borne out in a question that asked what respondents would recommend to others who are embarking on automation projects. As Table III-5 shows most respondents themselves developed standalone systems. However, they advise others against it: 28 advised libraries to have an overall plan and implement one step at a time and 16 advised development of integrated systems right from the start; only 4 recommend unrelated projects.

Although libraries faced constraints in developing these systems, few considered them unusual enough to warrant reporting. Some that were reported were: "forced to use non-library programmers -- Moral: use outside assistance at your own risk," "lack of funds to perform systems study," "staff unwillingness to automate" (this system had a happy ending, since the staff attitude went from negative to enthusiastic), and "took months to get approval to put standard [serials] form on continuous form paper."

The desire to improve existing systems was reported by many respondents. The major types of improvement being planned include conversion to on-line operation; inclusion of additional materials (e.g., to include serials in a circulation operation); and extension of user services (for example, to provide SDI or to allow users on-line access to catalog data base). A few projects (9 out of 68 for which these data were supplied) used other systems as models, but most libraries apparently did little in the way of analysis of other systems. Those reported as serving as models were: for acquisitions--Yale Medical and University of California at San Diego; for cataloging--technical report system of Fish and Wildlife Project, U.S. Department of Interior (maintained at Denver Public Library), Naval Postgraduate School, Naval Weapons Center, Yale, Monsanto Chemical Company; and for serials--the Johns Hopkins University Applied Physics Laboratory, the National Center for Atmospheric Research, and Washington University Medical School libraries.

Respondents were asked about the depth of analysis made prior to systems development. In-depth studies were made for 32 projects and none was made for 35. Examples of such studies include: file analyses, manual simulations, equipment evaluations, in-house requirements analyses, and file structure studies. The lack of such studies in 35 projects (and perhaps for many others for which this question was not answered) may be explained by lack of staff and funds, by the existing familiarity with operations, and, perhaps, by the lack of familiarity with need for such studies.

Hardware and Software Aspects

Approximately 75 percent of the libraries with automation projects have computer-based systems. In most cases, the equipment belongs to the local agency. Two libraries reported using the parent agency's computer equipment; one, commercial and university-owned computers; and one, another Federal library's computer. In each application area except cataloging, the majority of the systems were developed from the beginning as computer-based systems. In contrast, a significant number of cataloging systems--30 percent--began as punched-card systems and were later replaced by computer-based systems.

As illustrated in Figure III-3, a wide range of computer makes and models are used in the various library applications.

Burroughs B3500
CDC 160A, 3300, 3800, 6400, 6600, 6700
Digital Corporation PDP-8 and PDP-10
GE 225, 427, 635
Honeywell 200, 800, 800/200, 1250
IBM 7030, 7090, 7094, 1401, 1410, 360 Series, 360/20, 360/30, 360/40, 360/50, 360/50-75, 360/67, 360/91
MANIAC
RCA 70/45, 70/456, Spectra 70/301, 301
UNIVAC 418, 490, 1005, 1106, 1107, 1108
XDS 940

Figure III-3. Computers Used by Respondents

Some of the more sophisticated equipment reported to be in use includes optical character readers (3 libraries) and computer output-to-microfilm (COM) equipment (2 libraries). For example, the NASA Manned Spacecraft Center Technical Library produces a book catalog from COM output. Nine of these libraries use on-line terminals for such operations as input of catalog records and information retrieval.

All respondents reported overall satisfaction with the computer support they were receiving (See Table III-6). (Note, however, that there is somewhat more satisfaction with the time alloted than the scheduling of the time.) Some respondents also noted problems with particular applications: for example, one SDI system was already operational but had to be scrapped because of lack of computer time. Some respondents also noted problems in scheduling for large blocks of time, e.g., for an annual book catalog cumulation.

The amounts of computer time required for automated operations varied widely. Some respondents were unable to provide data; others reported use of 2 or 3 computers, with large amounts of time expended on second-generation equipment; others reported the time for an integrated system that encompassed several operations. The average number of computer hours per month for acquisitions operations was 19 (for 6 respondents); for cataloging, the average was 5.3 (for 10 respondents); for circulation, the average was about 2 hours per month (7 respondents); and for serials, about 2-1/2 per month (17 respondents).

Many libraries were unable to obtain their own input equipment, and library input was accomplished outside library control. Some respondents also noted problems with restricted character sets, poor quality output printing and other limitations that hampered library usage.

TABLE III-6. RESPONDENTS' ASSESSMENT OF COMPUTER SUPPORT

Assessment	Allocation of Computer Time				Scheduling of Library Jobs			
	Acq.	Cat.	Circ.	Ser.	Acq.	Cat.	Circ.	Ser.
Very satisfactory	4	6	7	7	3	3	6	6
Usually	4	10	2	7	4	10	3	3
Partly	0	1	2	1	1	2	1	4
Usually unsatisfactory	0	0	0	1	0	0	0	0
Very unsatisfactory	0	0	0	0	0	0	0	0

For the major applications of cataloging, acquisitions, circulation, and serials, the programming languages used, in order of frequency, were COBOL, FORTRAN, and various assembly languages. The remainder included PL/1 and some combinations of the various languages already noted, plus RPG, SORTGEM, BASIC, SNOBOL, and GECOM.

Respondents were asked to identify the types of documentation that existed for their system. Types of documentation suggested were:

- Systems Analysis Studies
- Requirements Specifications
- System Design Specifications
- Program Design Specifications
- Operator's Manual

- User's Manual
- Performance Testing Specifications
- System Modifications

Of the 54 projects for which this information was supplied, only 17 reported systems analysis studies, 15 reported requirements specifications, and 15 reported system design specifications. Twenty-five reported program design specifications. Operator's manuals were available for 21 projects, and user's manuals for 28 projects. Five reported performance testing specifications and 14 projects documented system modifications. Clearly the most prevalent form of documentation is user and operator manuals and program design specifications. If we assume that the many projects for which this question was not answered did so because documentation is unavailable, then documentation of Federal library systems is probably a neglected area in general. However, the documentation supplied by some libraries to the SDC Project Team was excellent.

FUNCTIONAL APPLICATIONS

This section discusses the various computer-based applications in Federal libraries. The major applications discussed are for acquisitions, cataloging, circulation, and serials; all other applications are included last under "Other Automated Functions."

It should be noted that respondents characterized their systems in different ways: for example, some included subscription renewal as part of an automated acquisition system; others reported this as part of an automated serial control system. Some systems were highly integrated within a functional area such as serials, while others were essentially free-standing systems. The SDC Project Staff did not attempt to reconcile such differences. The discussion that follows, therefore, is based on the respondents' views of where their systems fit into their total library operations. For each application area, information is based on the response to the application questionnaire and the related information gathered during the preparation of the system descriptions.

Acquisitions

Ten libraries reported projects for automated acquisitions functions. Of these, four are operational, three are operational but still in testing, two are in the analysis and design stage, and one is in the preliminary planning stage. The data reported in this section reflect the questionnaire responses of only nine libraries: no details were provided by the one library in the preliminary planning stage. From these data it is clear that acquisitions is just beginning to be an area of attention for Federal library automation. We can only speculate whether this is due to the annual workload, the complexity of acquisition systems, its internal vs external orientation, or to other factors.

Technical Aspects. The design features of the nine acquisitions systems are summarized in this section. All systems reported provision for listings of items on order. Eight systems include subscription renewals in their acquisitions systems; provide multi-access, e.g., by author, order number, etc., to the in-process or order file; produce cards or other forms to control newly received materials through the technical processing cycle; and perform various statistical analyses of acquisition activities. Seven systems provide status reports on items on order. Six systems automatically produce the actual order form, include fund encumbrancing and accounting for all or most orders, provide products for payments and disbursing, produce bibliographic data useful for cataloging, and provide announcements of new acquisitions.

Features occurring in only a few systems include: provision for searching and book selections from MARC tapes (one system), automatic vendor assignment (two systems), maintenance of desiderata (want) files (four systems), vendor performance analysis (four systems), claiming (five systems), arrival notices to requesters (one system), SDI notices of new receipts (three systems), and bindery information (one system). The Air Force Cambridge Research Library plans to use MARC II extensively. It presently extracts entries from current MARC tapes for all items in the Q, T, and Z class numbers. These are printed out for book-selection purposes. In the total system being planned, the MARC II data for the items selected would be carried through all subsequent processing. Although the capability exists in three systems for transmitting orders in machine-readable form to agencies or vendors, none of the libraries is doing so at present.

Five systems incorporated features that allow handling materials received from blanket order dealers and materials received as gifts or without payment. Six systems handle materials for which advance payment is required. Only three systems incorporate materials received on exchange. Among the files maintained by these systems were library membership files (three systems) and exchange partner files (one system).

The number of orders handled by these systems annually range from 800 to 25,000 titles. The average system handles approximately 3700 titles. In most cases, the automated system handles from 90 to 100 percent of the total titles ordered annually; in some cases, this volume of activity includes handling of purchase requests from other libraries. Four libraries process requests for other libraries, and one library handles requests for 35 to 40 offices in the agency.

In nine systems order information is input by the library staff; in another, the input is accomplished by agency data processing staff. One system used a commercial firm for data input and one system plans to obtain input from the MARC data base. One library uses both library and agency data processing staff to accomplish data input; a school library system (the District I Media Center in Japan) uses library staff and high school students who keypunch purchase requests as part of their data processing training. (These add up to more than the 10 operational and planned systems, since more than one input mode is used in some cases.)

As shown in Table III-7, the automated acquisitions systems accommodate a wide range of materials. Although two systems handle only periodicals or only serials and periodicals,[1] most of the acquistions systems handle several types of materials, ranging from 3 to 11 different types.

Management and Administrative Aspects. Although one respondent indicated that no area of acquisition caused problems because they had an excellent programmer, others identified various problem areas. These fell into four categories: order routines, data input, transition, and interface. The order routines that caused problems were handling partial receipts (two respondents noted this) and claiming (two respondents). Four respondents reported problems in

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[1] Other libraries reported their periodical acquisitions systems as serials systems; these are discussed later in this section.

TABLE III-7. TYPES OF MATERIALS ORDERED THROUGH RESPONDENTS' ACQUISITION SYSTEMS

Monographs	8
Monographic technical reports	7
Monographic government documents	7
Continuations, e.g., encyclopedias	8
Technical reports issued in series	3
Periodicals	7
Other serials	7
Audio-visual materials	2
Pamphlets	4
Maps	3
Microforms	4

input of order information and two specified that finding and correcting errors in machine-readable files caused problems. Three noted the difficulty of phasing-in the automated order procedures. Interface with cataloging was noted by one respondent as a problem.

All of the above problem areas are internal. However, acquisitions, more than any other operation, interfaces with other agency routines. Two respondents identified interface with agency purchasing procedures and four noted interface with agency budget control procedures as causing significant problems. This aspect of acquisition would need careful study in developing generalized programs, since local agency practices probably vary both within and between agencies.

With one exception, respondents felt that their system was meeting--almost completely or at least in part--the objectives originally planned for it. (The one librarian answering "no" to this question indicated, by way of explanation, that the programs were originally written by nonlibrary programmers: "Round No. 1 was a disaster and the programs are being rewritten.") The positive effects of automation on acquisition practices are listed below in order of importance.

1. Better control over items ordered or received but not cataloged.
2. Improved communication with agency personnel requesting items.
3. Improved claiming procedures.
4. Greater control over status of funds.
5. Larger volume of work handled with same or smaller staff.
6. Prompter payment of invoices.
7. Automatic generation of order forms.
8. Maintenance of an in-process file listing.

As a specific example of staff time saved, one library estimated that 12 hours of computer time had replaced 500 hours of manual labor in handling annual subscription renewals. On the other hand, all but one respondent pointed out general problems or deficiencies in their local programs. Specific system problems cited were:

- Absence of edit and file maintenance programs
- Inability to generate LC catalog card orders
- Limitations in financial control area
- Need for more output products

The general problem areas were mostly time-related, e.g., time required for input preparation and for file maintenance and updating.

To probe the personal aspect of the system, respondents were asked to report on staff attitudes prior to and after implementation. The results are shown in Table III-8. (The difference in number of respondents is due to the two nonresponding libraries whose systems are still in the planning stage.)

TABLE III-8. STAFF ATTITUDES TOWARD AUTOMATION BEFORE AND AFTER IMPLEMENTATION

Attitude	Prior to Implementation	After Implementation
Enthusiastic	3	3
Willing	2	3
Neutral	3	2
Negative	3	1
Hostile	0	0
Don't know	0	0

No clear patterns of shifts toward the negative or positive end emerge in examining each library's response to this question.

Cataloging

Cataloging is the most frequently automated operation in Federal libraries. Information was obtained from 32 libraries, of which 23 had operational systems. Four libraries had systems that were operational but undergoing final testing, 2 had systems in the programming and debugging stage, and 3 had systems in the preliminary planning stage.

Technical Aspects. Automation can be applied to several areas of cataloging, and therefore the systems reported vary widely in the specific cataloging operations they include. Sixteen systems input data locally, although some use contractors to build their data bases. Two systems provide for obtaining catalog data from MARC, and 1 includes routines for editing MARC records for local use.

Nine systems incorporate maintenance of name authority files and 16 provide maintenance of subject heading or thesaurus files. In the more sophisticated systems, subject terms are automatically searched against the authority files and rejected if the term is not found; in less sophisticated systems these files are maintained primarily for updated printed lists of terms.

The major use of machine-readable catalog data is for production of printed products. Eighteen respondents print book catalogs, 13 print catalog card sets, 6 print or punch book cards, and 4 print labels for book pockets and spines. The machine-readable data support a number of less common catalog products, including special lists and bibliographies (19 systems), abstract and index lists (7 systems), and keyword indexes of various types (7 systems).

Use of direct data base search is not as common, but 14 systems can search on various data fields for information retrieval from the local catalog data base, and 5 report being able to search other data bases such as MARC. Two systems incorporate SDI from the catalog data base.

The machine-readable data can support some management tasks as well. Seventeen systems maintain a machine-readable shelflist or other inventory control list. Eight systems provide statistical analyses of items cataloged, 5 provide analysis of the use of thesaurus or subject heading terms, and 4 systems provide analysis of the cataloging operation itself.

Of the majority not currently using the MARC II tape distribution service, only two respondents indicated they planned to do so in the future. Those who said that they were not going to use it or were still undecided gave the following reasons:

- Not cost-effective for our volume
- Not current enough
- No need for it
- Not studied in enough detail
- Not applicable

Although detailed information about these catalog data bases was not obtained, it seems clear that it would be difficult to combine them. There are a number of variables: fullness and style of local cataloging; format and tagging structure; variability in input, e.g., upper case only as opposed to upper and lower case; and type of materials included. These aspects are described in more detail below.

Only 4 respondents input full LC catalog data, 3 modify it, and 12 provide full local cataloging similar to, or based on, LC. Seven input modified (i.e., non-full) local catalog data; 5 input brief records only; and 4 have various combinations, e.g., modified LC and brief local input, full local and modified LC, etc.

Format features are summarized in Table III-9. The influence of MARC is being felt in the newer systems, but nonstandard local formats are still in the majority. Table III-10 shows the bibliographic data fields included in the catalog records.

More than half of the systems provide search of the data base by author, title, and subject. Fourteen provide search by call number, 10 by date and publisher, and 5 by place of publication. Other data base search fields included language of publication, form of material, security classification, contract and/or report numbers, and country of publication.

The types of materials included in these systems are shown in Table III-11. In addition to these materials, respondents reported drawings, patents, translations, reprints, and theses.

TABLE III-9. FORMAT FEATURES OF AUTOMATED CATALOG SYSTEMS

Type of Format	No. of Systems
Based on Project MARC format	2
MARC II format	1
MARC II format, modified	1
Non-MARC local format	10
Standard format used by more than one library	6
TID 4581	1
DD 1473	1
Atlas	1
SHARP	1
Data Fields and Codes	**No. of Systems**
All bibliographic data are in fixed fields	8
All or most bibliographic data are in variable fields	11
Includes search codes as well as bibliographic data	5
Includes fixed field search codes similar to MARC II format	4
Includes fixed field search codes less complete than MARC II format	5
Records include sort keys	7

TABLE III-10. DATA FIELDS INCLUDED IN MACHINE-READABLE CATALOG RECORD

Data Field	Number of Respondents Using			
	Full Field	Modified Field	Brief Field	No Fields
Main (author) entry	15	8	3	0
Title	21	4	1	0
Edition statement	11	4	3	3
Place of publication	10	5	1	4
Publisher	12	3	3	4
Date	17	6	1	0
Collation	7	4	3	4
Price	4	1	0	13
Series notes	8	8	1	2
Bibliographic notes	6	3	3	5
Subject added entries	12	3	1	4
Series added entries	8	4	2	4
Other added entries	7	4	2	4
LC classification	4	2	1	11
Dewey Decimal classification	3	0	0	12
NLM call number	1	0	0	12
NAL call number	1	0	0	12
UDC number	1	0	0	14
International Standard Book Number/SBN	1	0	0	12
LC card number	2	0	0	12
Supt. of Documents classification	1	0	0	13
Accession or other local identification number	22	0	0	1
Contract number	13	2	1	4
Annotation	3	3	1	11
Abstract	2	0	1	14
Non-printing index or subject terms	7	1	2	7

TABLE III-11. TYPES OF MATERIALS INCLUDED IN AUTOMATED CATALOGING SYSTEMS

Type of Material	No. of Systems Including
Monographs	13
Monographic technical reports	21
Monographic government documents	17
Continuations, e.g., encyclopedias	9
Technical reports issued in series	20
Serials	10
Audio-visual materials	2
Pamphlets	9
Maps	4
Microforms	10

As illustrated in Table III-12, the annual cataloging load handled by automated systems varies widely. However, there is not much dispersion between the first three quartiles, so the majority of systems are small compared to non-Federal automated catalog systems. Nonetheless, a few systems have accomplished conversion of their entire catalog and several have converted substantial portions of their catalogs. The small ranges shown in this table reflect the fact that some of these systems have just recently become operational.

Respondents provided estimates of the total annual catalog load that is included in the automated system. Ten libraries include all new titles, 4 libraries include 95 percent or more, 2 libraries include 90 percent, 1 library 75 percent, 1 library 60 percent, and 4 libraries include from 40 to 50 percent.

TABLE III-12. RECORDS ADDED ANNUALLY AND TOTAL RECORDS IN MACHINE-READABLE CATALOGS

Item	M	Q1	Q3	Range
Number of Unique Records Added Annually to Machine-Readable Catalog [N=19]	5,000	2,475	6,500	2,000-60,000
Total Number of Unique Records in Machine-Readable Catalog [N=16]	29,750	8,915	46,250	600-300,000
Percent of Total Catalog Records Converted [N=11]	78	45	86	10-100

Eighteen libraries plan to produce, or currently produce, a book catalog. Most catalogs are for internal use rather than outside distribution. The numbers of copies prepared for internal use range from 1 to 50, and for outside use, from 2 to 700. Approximately 75 percent of the book catalogs are computer printouts. Two systems use computer output-to-microfilm, and the others are printed by Multilith, Itek, or photo typeset. Two systems reported that their book catalogs are prepared by contractors. Most libraries issue monthly supplements to the book catalog.

The variety of book catalogs is shown in Table III-13. Most respondents use more than one catalog, e.g., an author catalog and a subject catalog. Catalogs are also arranged in classified order, by accession number, by form of material, and by department (for an academic library). The character sets used for producing book catalogs and catalog cards are shown in Table III-14.

TABLE III-13. TYPES OF BOOK CATALOG (OR INDEX) ARRANGEMENTS

Book Catalog Arrangement	No. of Systems Using
Bookform shelflist	7
Dictionary catalog	3
Author catalog	11
Title catalog	9
Subject catalog	9
Series catalog	2
Author/title catalog	3
Title/subject catalog	2
Contract or report number catalog	8
Main entry catalog with added entry, title, and subject index or cross references to entry number	2

TABLE III-14. CHARACTER SETS USED FOR PRODUCING BOOK CATALOGS AND CATALOG CARDS

Character Set	No. of Systems Using for:	
	Book Catalog	Catalog Cards
Upper case only	16	7
Upper and lower case	0	4
Includes diacriticals	0	1
Does not include diacriticals	9	5
Is the recommended ALA/USASI standard	0	1
Meets some other standard (specify) COSATI	1	0

Management and Administrative Aspects. A number of problems were noted in automated cataloging systems. Sixteen respondents reported problems in ensuring accurate input of the catalog record. Fifteen specified problems in file maintenance for adding, correcting, and deleting records, while 10 identified computer sorting for proper filing order as creating difficulties. Nine respondents reported problems in handling files as the data base increases in size. Other problems were phasing-in the automated system, printing catalog cards, and interfacing the catalog system with other automated systems.

Only 1 respondent felt that the system did not meet the objectives originally planned for it. The majority of respondents noted a wide range of benefits from catalog automation, including:

- Speedier cataloging of items on MARC tapes
- Application of catalog data base in support of other library operations
- Time saved by elimination of card filing and revision
- Wide range of products from one keyboarding operation
- Ability to handle increased volume of material
- Improved statistical data
- Multiple distribution and access permitted by book catalogs

Notwithstanding these benefits, some major deficiencies were also noted by respondents. Most of these related to specific equipment or design features. Some general deficiencies include:

- Cost of keeping records updated
- Time required for achieving acceptable records
- Teaching patrons the new system
- Time lags between making changes and receiving prooflists

System-specific deficiencies were:

- Limited character sets
- Inflexibility

- Lack of mass storage to accommodate data base
- Exacting requirements for optical scan input
- Severe truncation of information of fixed field records

Seven respondents reported that automation did not change present cataloging practices; several reported that they now indexed or classified to a greater depth and used a fuller bibliographic record. Most respondents reported that their staffs had either neutral or positive attitudes toward catalog automation before and after implementation. Although some shifts of attitude are revealed in individual situations, no clear pattern emerged. In examining the benefits and deficiencies listed above, it is clear that, regardless of initial attitude, the dissatisfaction with local equipment and with system designs that force constraints, e.g., limited data input, would weigh heavily in staff satisfaction.

Circulation

Eighteen libraries reported automated circulation systems, of which 12 are operational, 1 is in final testing, 2 are in analysis and design, and 3 are in preliminary planning. Very few of the data included in this section reflect systems that are now in a planning stage; in most cases, descriptions relate to operational systems only.

Technical Aspects. The automated circulation operations reported by respondents are shown in Table III-15. In the survey, respondents were asked about automatic routing of technical reports. No system reported this activity, but since technical reports are more typically handled in selective dissemination of information systems or in integrated technical report systems, the lack of response to this particular item is not surprising. However, the number of automatic routing of journals systems is larger than is shown here, because some libraries reported this activity in their serials system description. Almost one-half of the systems either currently use or plan to use machine-readable personnel files created and maintained elsewhere in their agencies. Ten systems now use or plan to use a machine-readable book card (e.g., punched card). Only 5 systems use a machine-readable borrower identification card.

TABLE III-15. FEATURES OF RESPONDENTS' CIRCULATION SYSTEMS

Number of Respondents	Features
13	Charging and discharging
10	Renewals
12	Control of requests for reserves, special routing, etc.
6	Control of loan period, i.e., automatic assignments for categories of materials or types of borrowers
4	Automatic routing of current journals
2	Accounting for replacement charges for lost or damaged items
11	Listings of items in circulation
1	Listings of newly returned items
12	Listings of items circulated to certain borrowers or types of borrowers
13	Printing of overdue notices
10	Maintenance of machine-readable borrower files with addresses, locations, etc.
5	Statistical analysis of circulation operations
7	Statistical analysis of items circulated

Four systems converted the shelflist or similar file, to create a machine-readable master inventory control file. Thus, we conclude that the majority are automating control of materials in circulation only, as opposed to automating the full inventory. The number of records converted for these 4 systems were 510, 4000, 50,000 and 63,422, respectively. The record formats ranged from a brief 60-character format to one essentially as complete as the MARC II format.

The data fields included in circulation transaction files and other associated control files, are, in general, only those essential to the circulation function. For example, 4 respondents include the complete main entry, and 4 shorten it. Three include the full title, and 5 shorten it. Five include date of publication, 3 include publisher, and only 2 include place of publication. Nine systems include the full call number, including copy number, and 2 include location of item (e.g., special collections). Five systems include a code for type of material (e.g., microform). Subject headings and added entries were noted by one respondent each; these may be systems where a catalog record is used as a master inventory file. Other data fields included codes for reserve materials (for an academic library) and security classification codes. One system includes a field in its master inventory file that indicates the number of times an item has been circulated.

The majority of systems handle local loans for a standard loan period only. However, 6 systems have flexibility in adjusting loan periods, 3 systems include local overnight loans, and one system provides for local loans of less than 8 hours. Seven systems control deposit of materials in special branches, laboratory collections, etc., where the loan period is for a relatively long time. Eight systems handle interlibrary as well as local loans. In addition, one system handles local loans for classified documents and another handles textbook checkouts for the length of a course.

Although some systems handle only one type of material (e.g., classified materials, periodicals, or books), the total systems surveyed cover the full range of materials. Books are the predominant category of materials handled, as shown in Table III-16.

TABLE III-16. TYPES OF MATERIALS HANDLED BY AUTOMATED CIRCULATION SYSTEMS

Type of Material	Number of Respondents
Books	13
Unbound periodicals	5
Unbound serials	3
Bound periodicals	3
Bound serials	3
Technical reports	7
Microforms	3
Maps	2
Audio-visual materials	2
Internal documents	5
Security classified materials	6
Uncataloged materials	2

The variations in size of these systems, and their relationship to the total circulation activity, is indicated in Table III-17. Even the largest reported activity (138,800 transactions, or about 530 a day) is significantly below circulation loads in most public and university libraries. This suggests that the traditional belief that automation of circulation is justified only for large transaction rates (i.e., thousands per day) may not be valid for Federal libraries. Perhaps a more important reason to automate is to relieve the staff of time-consuming circulation control tasks. This justification is in line with the data on staff sizes reported in the first section of this chapter.

TABLE III-17. VOLUME OF ANNUAL CIRCULATION ACTIVITY AND PERCENTAGE HANDLED BY AUTOMATED SYSTEMS

Circulation Activity	N	First Quartile	Median	Third Quartile	Range
Number of Annual Circulation Transactions	14	20,350	50,000	71,450	3000-136,800
Percent of Transactions Handled by Automated System	15	56	75	95	4-100

Management and administrative Aspects. Fewer problems were noted in operating automated circulation systems than in other library automation operations. Two respondents reported difficulties in preparing machine-readable book cards for their collections, 2 reported difficulties in phasing-in the automated system, and 1 noted difficulties in conversion of the shelflist. Other types of problems included errors in systems that require manual keyboarding of borrower identification numbers, general programming problems, and staff uneasiness in adjusting to use of equipment.

It is interesting to note that none of the 5 respondents who use machine-readable borrower cards reported problems in issuing these cards. In college and university libraries this is often a major hurdle in phasing-in an automated circulation system. Since Federal libraries primarily serve agency patrons, these problems are apparently circumvented.

Respondents appear to be fairly enthusiastic about the effects of automation on their circulation practices, as evidenced in the responses shown in Table III-18 and the several additional comments provided. One respondent indicated that their system saved 40 hours per week in manual filing time; others added that their systems provided improved control of security documents, prompter circulation of periodicals, and improved book selection.

TABLE III-18. EFFECTS OF AUTOMATION ON RESPONDENTS' CIRCULATION PRACTICES

Effects of Automation	Number of Respondents
No major changes	1
Improved inventory control	11
Elimination of most manual filing	6
Better control over requests for reserved items	9
Prompter followup on overdue materials	8
Improved statistical analyses of circulation operation	5

Respondents were also asked in an open-end question to identify the major benefits of their systems. The following comments are illustrative of their responses:

- The majority of files have been eliminated.
- Patrons now view the library as a modern business.
- Preparation of overdue notices is easier.
- Inventory control is much improved.

Some general problems, such as file updating and input preparation, were identified; specific system deficiencies were also noted:

- Charge-out machine is not fast enough; a newer model is under study.
- Non-standard data codes are used.

- Charge records are made from preceding ones instead of from a master file.
- Terminals are sufficiently noisy that they must be placed apart from the circulation section of the library.

A shift of staff attitudes after implementation of circulation systems is clearly evidenced, as shown in Table III-19. As seen by the respondents, all changes in attitudes were toward the positive end of the continuum; the most striking examples were the "hostile" group, which moved to the "willing" category after implementation, and the "negative" group, which moved to "enthusiastic."

TABLE III-19. STAFF ATTITUDES TOWARD AUTOMATION BEFORE AND AFTER IMPLEMENTATION

Staff Attitude	Number of Respondents	
	Before	After
Enthusiastic	2	7
Willing	6	6
Neutral	0	0
Negative	3	0
Hostile	1	0
Don't know	1	0

Serials

Thirty-one serials systems were identified: 22 are operational, 3 are operational but still being tested, 4 are in the analysis and design stage, and 2 are in preliminary planning. The following descriptions primarily reflect features of the operational systems.

Technical Aspects. Collectively, the systems reported cover almost all aspects of serials automation. Although some systems incorporated the major serials control features, the majority of the systems reported are single-purpose systems, i.e., subscription control or serials holdings lists.

A number of systems reported conversion of serials holdings records. Of these, 17 have complete holdings data for all or most titles in the conversion, 2 include current titles only, and 3 systems provide partial holdings records for all or part of their serials.

Seventeen systems provide control of subscription renewal operations. Eleven of these maintain funds accounting records in machine-readable form; 16 maintain machine-readable vendor or source address files, and 10 produce the orders automatically. Six systems include machine-readable library membership files and 3 maintain machine-readable exchange partner files. Five respondents maintain a union list of serials. These lists varied from those restricted to local Federal agencies, to agencywide listings and non-Federal and Federal libraries. Argonne National Laboratory Library also produces a union list for the Associated Colleges of the Midwest from punched card input received from 10 colleges. Thirteen systems provide printed renewal lists so that library and agency staff can review serial titles prior to issuing revewals.

Only 7 systems provide control over the receipt of new issues. Six of these accomplish check-in of issues through use of prepunched arrival cards and one system uses a computer-punched check-in list. All 7 systems include automatic claiming for issues not received. Six systems have computer-produced binding notices generated when a volume is completed.

A wide variety of printed products are generated to support various serials operations. In addition to those noted above, 16 systems provide listings of titles with partial holdings data; 13 provide listings with complete holdings data; and 12 systems produce listings by special aspects such as subject, language, locations, etc. The holdings lists that are intended to serve as basic library tools are generally updated annually. The number of copies printed range from 2 to 1000. Nine systems produce routing lists and 5 produce circulation slips for new issues.

Various statistical analyses were reported: 6 systems perform analyses of the collection, 5 of the serial operations. Other applications include provision of information on where serials titles are abstracted and indexed (5 systems) and inclusion of cross-references as serial titles change (14 systems). Twenty-three systems handled periodicals; 14 handled newspapers; 11 systems included annuals. Less frequently included materials were: technical reports (2 systems); government documents (2 systems); handbooks and works issued in frequent editions (5 systems); and sets in progress, e.g., encyclopedias (4 systems).

Most respondents reported that they use a brief record, with complete--or nearly complete--serial-record-type data (including holdings, gaps, routing). One planned system will use the proposed MARC format for serials. Over half the other respondents indicated that they were undecided on whether the MARC standard, when completed, would be used. The few who reported that it would definitely not be used cited reasons such as the following for this decision.

- Local system is already fully developed
- It would process very slowly
- It is too detailed for us

As shown in Table III-20, the sizes of these serials operations vary greatly.

TABLE III-20. ESTIMATED SIZE OF SERIALS OPERATIONS

Serial Holdings	M	Q1	Q3	Range
New or Renewed Subscriptions (Copies Annually) [N=20]	1800	500	3000	150 - 5000
Total Number of Serial Titles (Currently Received) [N=24]	1200	500	2200	165 - 4000
Total Number of Serial Titles (Current and Dead) [N=18]	1818	956	3262	185 - 10,000

Of those systems including the check-in of current issues, from 80 to 100 percent of the current titles are processed by the automated systems.

Management and Administration Factors. In general, respondents stated that their projects were meeting originally planned objectives, completely or at least in part. Although the precise nature of these objectives is not known, the following system benefits were identified:

- Time saving (e.g., "reduction in time--from 3 months to 1 week--to generate orders," "2 hours of computer time for what used to take 9 months")
- Ensured subscription continuation
- Currency and improved accuracy of listings
- Greater statistical analysis capabilities; better management information
- Elimination of repetitive functions (e.g., retyping complete subscriptions list yearly)
- Useful outputs (e.g., subject printouts helpful in bibliography preparation)

Respondents also identified what they considered to be major deficiencies in their systems. Most of these reflect local design or equipment problems such as:

- Built for second-generation equipment
- Batch mode unsatisfactory for serials
- Outmoded EAM equipment; computer required to handle more data
- Lack of cross-references
- Bindery and claiming programs needed
- No recording provisions for single missing issues--only large gaps
- Nonautomatic posting

Problems related more directly to the difficulties of serials from a bibliographic standpoint include the handling of renewals (2 respondents), irregular serials (7 respondents), incomplete holdings (5 respondents), title changes (5 respondents), and claims (2 respondents). In addition, nine respondents had problems in maintenance and correction of machine-readable records, 4 reported difficulties in phasing-in automated operation, and 2 had problems in interfacing the automated serials system with other library operations.

A comparison of staff attitudes before and after system implementation is shown in Table III-21. An examination of individual answers revealed that half of the respondents reported no attitude change; of the remaining half that did experience some shift of attitude, all but one moved in a positive direction.

TABLE III-21. COMPARISON OF STAFF ATTITUDES TOWARD AUTOMATION BEFORE AND AFTER IMPLEMENTATION

Staff Attitude	Number of Responses	
	Before Implementation	After Implementation
Enthusiastic	4	11
Willing	11	8
Neutral	4	1
Negative	3	0
Hostile	0	0
Don't know	1	0

Other Automated Functions

A variety of other applications was reported. These included SDI systems, various indexes and bibliography publication systems, local document distribution systems, and some miscellaneous operations. These are characterized briefly below ; details are given in the system descriptions in the Handbook on Federal Library Automation.

Selective Dissemination of Information and Current Awareness. Twelve respondents reported SDI systems, of which 7 have achieved operational status. In addition, many other applications,(e.g., cataloging) include some SDI-like services that promote current awareness. The characteristics of some of these systems are noted in the following paragraphs.

The Bonneville Power Administration Library provides weekly current awareness and retrospective searches from a data base of 22,000 records input over a 5-year period. The National Oceanic and Atmospheric Administration Boulder

Laboratories Library has an SDI system that uses a data base created as a by-product of automated cataloging and services about 600 users weekly. The Bureau of Reclamation Library in Denver has an SDI system for 2100 engineers that has been operational since 1963. The NASA Manned Spacecraft Center Library in Houston uses the NASA STAR data base to search 115 profiles for current citations for 500 users. Tapes received from NASA headquarters are converted for local use and the 600,000 NASA records are supplemented by about 200,000 local records. The Naval Research Laboratory Technical Library uses PANDEX tapes for its SDI service. These tapes are also used to assist in local book selection. The system has just become operational and it is planned that 800 SDI and 25 retrospective searches will be run monthly.

Bibliographic Publications. Thirteen libraries reported systems for production of bibliographies; 10 of these are operational. These systems produce accessions listings at weekly, semimonthly, or monthly intervals; subject bibliographies; or listings and bibliographies for special collections. The Army War College Library produces both complete and selected listings of student theses for distribution. These listings have subject indexes which are cumulated annually. The National Oceanic and Atmospheric Administration Boulder Laboratories Library prepares an Instruction Manuals Catalog that covers the collection of manuals for maintenance of local agency equipment. This catalog is arranged by equipment manufacturer and was designed to aid technical personnel.

A number of these systems are designed to control local agency staff publications. One of the largest of these is the system at the AEC Los Alamos Scientific Laboratory. The system includes information on journal articles, books and book chapters, reports, theses, and patents generated by LASL staff. The record includes not only the original citation, but information about successive publication. The data base to support LASL Authors in Print includes 13,000 records.

Information Retrieval. Eighteen respondents reported information retrieval systems; of these, 14 are operational. These systems use both local and outside data bases.

Three systems provide information retrieval by use of microform retrieval systems. The Naval Undersea R&D Center Technical Library has a partially operational system for information retrieval from a technical report data base. They will also produce a book catalog. The Defense Logistics Studies Information Exchange has been operating their system since 1962. They include a wide range of bibliographic materials in the system and analyze these to 11 levels of hierarchical indexing. On demand searches can be made on any one or any combination of the 48 data fields in the record, 16,000 records are contained in the data base. The Naval Postgraduate School Library's SABIR3 system provides information retrieval from a data base of 53,561 records; about 20 regular and 230 on-demand searches (each of which may involve multiple questions) are processed monthly.

Abstracting and Indexing. Four abstracting and indexing systems were reported, of which 3 are operational. In addition, many of the systems identified as cataloging systems also incorporate abstracting and indexing features. In general, these systems are developed in conjunction with information retrieval systems as well as publication systems for preparing book catalogs and lists.

Miscellaneous Applications. A number of projects were reported in this area. Two libraries have systems for distribution and mailing of agency reports. Another library reported experimentation with MARC tapes to determine the range of library applications that they might support. The U.S. Military Academy Library reported a system for management analysis on use of reserve book facilities. The analyses show time vs attendance in graph displays and compare present to past usage. The Pacific Southwest (PSW)

Literature Services center (a USDA Forest Service library) has a unique application in which the Services' catalog system is used to support user data bases. Thirty such individual data bases are maintained and users have great flexibility in personalizing the format to suit their own needs. The Services' staff serve as consultants to the users in helping them structure the data bases.

MANAGEMENT AND IMPLEMENTATION FACTORS

The first part of the automation questionnaire asked respondents to explore the general management factors that influenced them the most in arriving at a decision to apply automation techniques in their libraries. These factors included such general characteristics as volume of activity, availability of equipment, availability of qualified staff, management support, control of materials and operations, staff knowledge of data processing techniques and automated library operations, etc. Table III-22 lists those factors that were of major importance, minor importance, or of no importance at all in making this decision. Responses indicate that the factor that influenced librarians the most was the need to improve services. Other important major factors include the need to improve control of operations, the availability of computer equipment and programming and systems analysis staff, and the support of both staff and supervisors. The factor most often reported to be of minor importance was interest and support within the library. Those factors most often reported of no importance at all were the availability of computer programs developed elsewhere and management request for automation.

Several librarians commented on other factors that were of major importance in making their decision to automate. These included the ability to use a larger character set, the need to shorten the production schedule for the publication of Nuclear Science Abstracts, the request for new services by the Department Library, the difficulty of obtaining staff, and the fact that computer costs are decreasing. The responses revealed that the decision to automate is consistent with the overall objective of any library or information center, which is to provide the best, most efficient service to their clientele, and that automated techniques are important tools that can be utilized to achieve this objective. General conclusions that can be drawn from the response to this question are that (1) most libraries with implemented automated systems have the full support of both management and staff, and (2) equipment and staff are usually available to implement these systems.

TABLE III-22. IMPORTANCE OF FACTORS IN DECISION TO AUTOMATE

Factors	Number of Responses		
	Major Factor	Minor Factor	Of No Importance
Volume of activity	35	17	3
Availability of equipment	42	13	1
Availability of systems analysts	37	11	5
Interest and support within library	29	23	3
Interest and support of immediate supervisor	36	18	3
Availability of computer programs developed elsewhere	5	18	26
Need to improve service	47	6	3
Need to improve control of operations	44	9	2
Availability of funds	22	20	10
Knowledge that similar automation programs had been successfully implemented elsewhere	21	20	14
Automation requested by management	14	13	25
Automation within library consistent with overall agency plans	15	18	18

When asked to describe their approach to undertaking an automation program, respondents were given a description of three alternative approaches generally used in the library community and then asked to (1) indicate the approach most like theirs, and (2) recommend the approach libraries should follow. The three approaches were:

1. The development and implementation of separate, unrelated projects for one or more library functions
2. The formulation of an overall long-range plan, but without detailed design of the entire planned system, and the development of projects for one or more functions in accordance with the overall plan
3. The development of the design for a totally integrated system in which one or more library functions are automated as modules meeting the specifications for the total system.

The response indicated that the majority of libraries followed the unrelated approach (item 1) but, based on their own experience, highly recommended that other libraries utilize the overall plan, implemented one step at a time (item 2). Some of the reasons given for recommending this approach include:

> "A step-by-step approach invariably reveals certain strengths and weaknesses in a system that are often difficult to predict in the planning stage."

> "An overall plan implementing one function at a time allows for one part of the system to be completely operational while the staff is concentrating on the next function to be automated."

> "When one step at a time is implemented, the library staff is not overwhelmed and can adapt their work procedures accordingly. Cost is spread over a period of time and management prefers this to a large initial increase in operation costs."

> "All library operations have one single objective: to provide information to the user. Automation of any function should be made in light of that objective. Since many library operations are adaptable to automation but are often costly, it is important to move ahead one step at a time. This will also facilitate employee knowledge and training and help staff morale."

Since personnel resources are a key factor in implementing any automation program, respondents were asked what their resources were, the extent of involvement of each, and an assessment of the quality of work produced by each. Personnel reported as most involved were the administrative staff of the library; programmers on the local agency staff; systems analysts on the local agency staff; systems analysts on the library staff; and personnel from commercial firms, such as contractors and consultants. Most respondents rated the quality of work performed by these various personnel as excellent or good, with very few rated as satisfactory or poor. The responses to this question are reported in Table III-23.

Management factors such as budget, staff, time, preparation of materials and files, equipment, contractor performance, and modification of equipment and physical facilities were explored by asking the respondent to check various conditions that reflected their experiences in managing an automated program. The answers to this question are described in Table III-24.

In addition to the factors discussed in Table III-24, respondents were asked for information related to staffing. Out of 53 respondents who provided information, 9 found it moderately difficult to get automation staff but were able to do so; 8 reported no problems in obtaining needed staff. Of 26 respondents who obtained no new staff for automation, 10 requested but were unable to obtain desired staff additions. Communications between library staff and nonlibrary automation staff presented no problem for 23 out of 49 respondents. Fifteen found communication less difficult that they had anticipated and 10 reported more difficulties than they had expected.

TABLE III-23. EXTENT OF INVOLVEMENT AND QUALITY OF WORK OF PERSONNEL INVOLVED IN AUTOMATION

Source	Number of Responses						
	Involvement		Quality of Work				
	Major	Minor	Excel-lent	Good	Satis-factory	Fair	Poor
Administrative staff of library	44	8	20	18	9	2	0
Administrative staff of local agency	6	11	3	7	3	0	1
Administrative staff of parent agency	4	7	2	3	0	1	2
Administrative staff of other Federal agencies	2	6	0	2	2	0	0
Systems analysts on library staff	14	2	8	4	0	1	1
Systems analysts on local agency staff	20	6	10	10	3	2	1
Systems analysts on parent agency staff	5	7	2	3	2	1	1
Systems analysts on staff of other Federal agencies	2	5	1	2	1	0	0
Programmers on library staff	8	6	6	4	1	0	1
Programmers on local agency staff	28	5	14	12	5	1	1
Programmers on parent agency staff	3	4	0	2	2	0	0
Programmers on staff of other Federal agencies	1	3	1	0	0	0	0
Consultants or advisors from other libraries or library organizations	0	9	1	3	2	0	0
Personnel from commercial firms (e.g., contractors, service bureaus, consultants	15	6	4	5	2	4	5

TABLE III-24. AUTOMATION MANAGEMENT FACTORS
BY NUMBER OF RESPONDENTS

<table>
<tr><th rowspan="2">Management Factor</th><th colspan="4">Assessment</th></tr>
<tr><th>Underestimated</th><th colspan="2">Overestimated</th><th>About Right</th></tr>
<tr><td>Automation budget</td><td>7</td><td colspan="2">1</td><td>32</td></tr>
<tr><td>Time allotted for system analysis and design</td><td></td><td colspan="2"></td><td></td></tr>
<tr><td>Time allotted for program preparation and debugging</td><td>19</td><td colspan="2">0</td><td>26</td></tr>
<tr><td>Time allotted for final program testing and operation</td><td>20</td><td colspan="2">1</td><td>22</td></tr>
<tr><td></td><th>More Than Anticipated</th><th>About What Was Anticipated</th><th>Less Than Anticipated</th><th>Not Applicable</th></tr>
<tr><td>Time spent by head librarian for overall supervision and planning</td><td>10</td><td>34</td><td>2</td><td>6</td></tr>
<tr><td>Time required for preparation of training materials and user manuals</td><td>12</td><td>19</td><td>3</td><td>16</td></tr>
<tr><td>Problems encountered in preparing files for conversion</td><td>16</td><td>29</td><td>2</td><td>7</td></tr>
<tr><td>Time required for monitoring contractor performance</td><td>7</td><td>4</td><td>2</td><td>29</td></tr>
<tr><td>Time required for equipment delivery and testing</td><td>4</td><td>8</td><td>1</td><td>33</td></tr>
<tr><td>Physical modifications to accommodate automated operations</td><td>1</td><td>16</td><td>1</td><td>31</td></tr>
</table>

Respondents were also asked to rank various underlying factors contributing to the problems encountered in system implementation in the categories of staffing, analysis, design and programming, equipment, and management. These rankings are shown in Table III-25. Ranking of problem areas in system operation are presented in Table III-26. Several respondents submitted additional comments relating to each of the four categories in Table III-25 that they thought might be helpful in assisting other Federal libraries in planning automation projects. These were:

Staffing Factors

In-house staff was too small

Too many organizations working on a relatively small project

Librarians only were used

Time for staff to work on the project was limited

Difficulty in obtaining personnel to fill vacancies

Low priority in use of personnel

Analysis, Design and Programming Factors

Personnel changes

Insufficient documentation

Lack of adequate funding and management support

Underestimated cost for updating library catalogs

Communication problems due to the physical distance between contractor and library

Equipment Factors

Limited equipment

Photocomposition equipment unavailable but needed

Management Factors

Change in program direction

Lack of more skilled people

Prevention of long-range planning and development of automation due to frequent changes of military supervisors

During early phase, insufficient library participation due to heavy workload

Finally, respondents were asked to indicate the methods they use to inform various groups of their automation project. As shown in Table III-27 planned meetings and oral progress reports are favored for informing directly and indirectly involved library staff and computer center personnel, and oral and written progress reports are favored for local agency administrators. Table III-27 also reveals that internal and local information channels are more numerous than those involving users, librarians in other Federal libraries, and the library community at large.

TABLE III-25. RANKING OF FACTORS CONTRIBUTING TO IMPLEMENTATION PROBLEMS

Factors	Ranking by Respondents					
	1	2	3	4	5	6-8
Staffing:						
Library staff's lack of experience with automation	15	12	5	5	1	0
System analyst's and programmer's lack of experience with library procedures	15	12	5	3	2	0
Changes in systems or programming staff during the project	4	6	6	3	1	1
Changes in project management staff during the project	1	3	1	0	3	3
Changes in library staff during the project	7	4	6	3	1	0
Changes in agency administrative staff during the project	1	2	3	0	0	2
Difficulties with computer center personnel not following instructions for library projects	4	3	4	2	2	2
Analysis, Design and Programming:						
Insufficient effort expended on systems analysis and design before programming began	5	9	1	1	0	0
Pilot tests or simulations did not reflect actual working conditions	2	2	3	1	1	0
No pilot tests or simulations were conducted	2	2	2	1	2	0
System designers and/or programmers did not understand our requirements	8	5	3	0	0	0
System documentation, including manuals for input and computer operation, was not detailed enough	12	4	1	1	0	0
Attempt to pattern our system after one developed elsewhere created problems	2	0	2	1	1	2

TABLE III-25. RANKING OF FACTORS CONTRIBUTING TO IMPLEMENTATION PROBLEMS (continued)

Factors	Ranking by Respondents					
	1	2	3	4	5	6-8
Equipment:						
Changes made in computer or other hardware during project	8	6	4	1	1	0
Low priority for computer time prevented or delayed system debugging	5	10	6	0	0	0
Allocation and scheduling of computer time not suitable to our needs	3	2	3	2	0	0
Library not allowed to obtain own input equipment	9	1	0	1	4	0
Available equipment not entirely satisfactory for library needs	7	4	1	2	1	0
Management:						
Budget cuts made during project	3	4	0	1	1	0
Year to year funding hampered project planning and management	5	0	2	1	1	0
Lack of funds prohibited pilot testing	0	1	0	1	0	1
Lack of funds prohibited doing enough detailed design prior to implementation	1	1	1	0	0	1
Inadequate planning for project management and control	3	2	3	0	1	0
Inadequate preliminary planning of automation project	7	1	1	2	0	0
Requests for Proposals or Quotes were not specific enough	0	1	1	0	0	1
Library management not given choice in contractor selection	1	1	1	0	0	1

TABLE III-26. RANKING OF PROBLEM AREAS IN SYSTEM OPERATION

Problem Area	Ranking by Respondents						
	1	2	3	4	5	6	7-14
Data input formats	10	5	4	3	1	0	6
Data input procedures	10	9	6	5	0	0	4
Error control procedures	8	12	1	5	2	2	3
File maintenance and security	3	3	4	0	5	1	6
Output formats	6	2	4	3	3	2	4
Data processing requirements	3	3	2	0	0	2	6
Sequence of work flow	0	2	2	2	2	3	7
Utilization of output products	0	1	0	3	1	0	9
Interface between automated system and manual operations automated	1	5	6	2	2	0	5
Transition from manual to computer operation	4	3	5	2	2	2	3
Back-up routines when computer unavailable	3	0	0	1	3	1	6
Provision for handling increased system loads	1	1	0	2	2	2	8
Provision for add-on of additional computer operations	1	0	2	2	1	2	7

TABLE III-27. METHODS USED BY RESPONDENTS TO INFORM GROUPS OF AUTOMATION PROJECT

Groups	Methods					
	Planning Meetings	Oral Progress Reports	Written Progress Reports	Published Project Reports	Seminars, Training Sessions	Presentations at Meetings, Conferences
Library staff directly involved	37	36	13	6	14	12
Other library staff	10	23	9	2	7	7
Local agency administration	7	23	24	4	2	8
Parent agency administration	1	8	14	4	0	4
Computer center personnel	25	15	9	4	2	5
Users	6	12	8	10	6	11
Librarians in other Federal Libraries	0	4	2	9	2	9
Library community at large	1	2	0	9	1	6

CHAPTER IV. THE FEDERAL LIBRARY COMMUNITY

INTRODUCTION

This chapter deals primarily with a description of the status of the Federal library community based on data gathered through the Federal library survey.* The details of the survey itself are reported in Chapter I of this report; the major findings of the survey are discussed in this chapter; and a detailed presentation of survey data is provided in the Appendix. References to these data are shown in parentheses, e.g., (Question 44), which refers to the original survey question and the response presented in the Appendix. Thus the Appendix not only provides the survey findings, but retains the original questions and arrangement of the survey document as well. In this chapter, however, the discussion deviates from the order of presentation in the survey questionnaire itself.

Within the past few years there have been a number of studies of the Federal library community. The majority of these concentrated on small segments of the community and the selection of libraries for investigation was often highly subjective. In addition, some studies have analyzed the literature about the Federal library community rather than statistical data and, as a result, some opinions about the community have gained credence simply through the process of successive citation. Furthermore, some studies received by the SDC project staff have provided statistics without documentation as to source. Because of these problems little effort has been expended in correlating the findings of this survey with previous studies.

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* The Federal Library survey included a number of questions on automation attitudes and opinions. These are discussed in Chapter V, The Future of Federal Library Automation.

The data reported here are not as comprehensive as one might wish. The failure of many Federal librarians to complete even a portion of the questionnaire, the occasional misinterpretations of questions, and the lack--in some cases--of local statistics, militated against achievement of the ideal. One is reminded of Robert Hutchins telling his assembled scholars that the University of Chicago was not a good university, it was just the best university there was. Similarly, the data presented here are not the best possible data on the Federal Library community, but they are the best available.

The survey also included a number of questions that probed general attitudes toward automation, automation of specific library operations, and capabilities for automation, e.g., access to computers and technical support staff. Responses to these questions are discussed in Chapter V.

GENERAL DESCRIPTION AND BACKGROUND

Several questions were asked to elicit information about Federal libraries, their relations to each other and to the outside world. The following section provides a general description of the Federal library community, the location of its libraries, their administration, and resources.

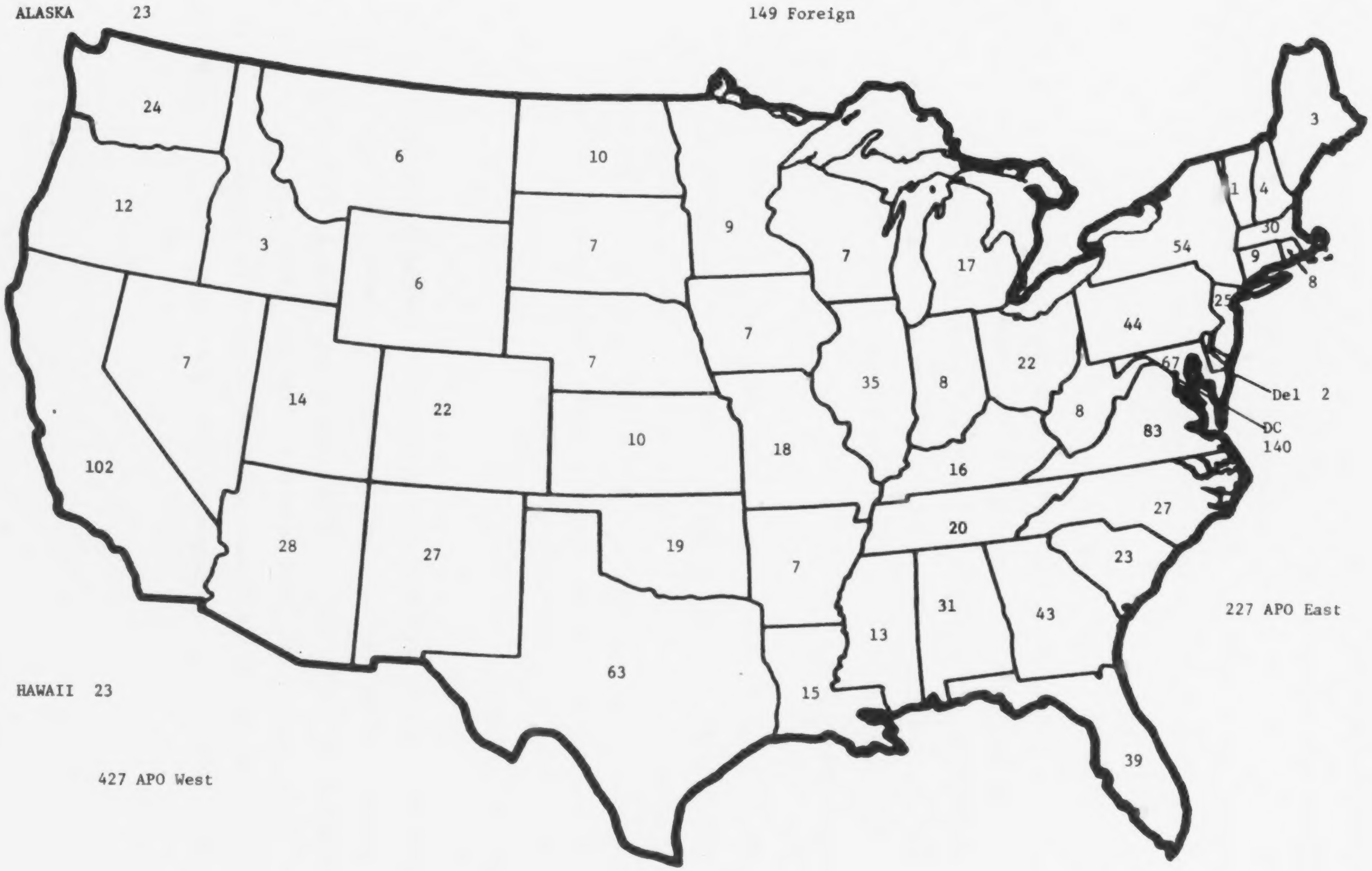
Geographic Distribution

The most up-to-date inventory of Federal libraries is the Roster of Federal Libraries, which was used as the basis for this survey. The libraries reported in the Roster are depicted on the map shown in Figure IV-1. Like the old British Empire, the sun never sets on the Federal library community, with its more than 2000 libraries, located in almost every country of the world and in all of the states of the U.S.

One surprising finding of this study is the comparatively low percentage, in numbers, of the Federal library community centered in Washington, D.C. or in the metropolitan Washington area. Even the most generous estimate of the latter (including all of Virginia and Maryland) amounts to less than 14 percent of all Federal libraries, and the former less than 7 percent.

Library Characteristics

Types of Libraries. Each respondent was asked to characterize his library as one of five types: technical or special, public, school, college or university, and archival or depository. Some libraries, such as Veterans Administration hospital libraries, have a collection and serve a clientele that is sufficiently diverse to require that the same library be considered as two different types; thus the percentages to this question total more than 100 percent.


ALASKA 23
149 Foreign
24
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25
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DC
140
27
28
27
19
20
23
7
31
43
13
63
227 APO East
HAWAII 23
15
39
427 APO West

Figure IV-1. Location of Federal Libraries, Based on Roster of Federal Libraries, 1970

Figure IV-2 shows the results of this self-evaluation. Most respondents were technical or public in type, although a significant number were school libraries. These data may not reflect the true proportions of types of libraries within the entire community, since many nonrespondents--especially those overseas--are public or school libraries. However, the three major types of libraries are those shown in Figure IV-2; college or university and archival libraries are a clear minority.

The technical or special libraries cover a wide range of interests. In addition to those in physics, chemistry, and electronics, there are libraries whose subject interests are law, geology, mining, archeology, history, and music. Many libraries in this class are medical, including research libraries, hospital libraries and one nursing school library.

Libraries similar to public libraries provide general and recreational materials. Most of these serve military personnel, their dependents, and hospitalized veterans.

The school libraries are primarily located overseas. These include kindergarten, grade school and high school libraries. Academic libraries service the military academies as well as a number of agencies that provide various types of training. The training schools are primarily in DOD installations.

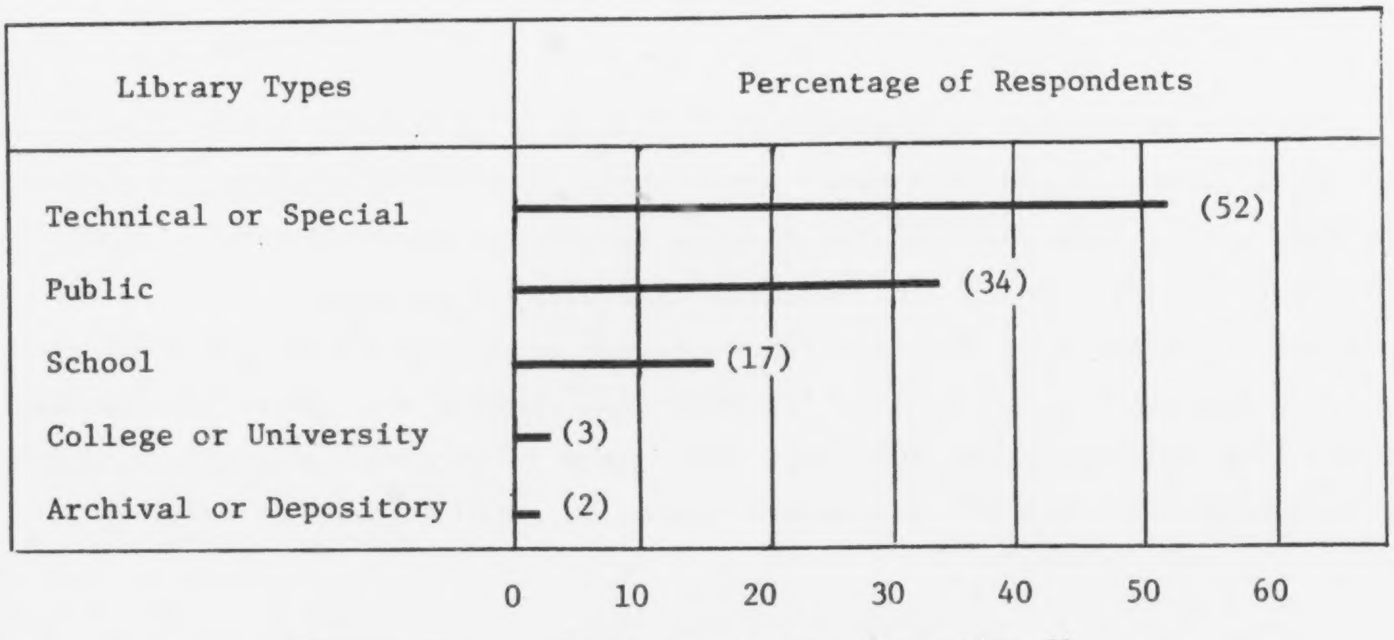

Figure IV-2. Types of Library (Question 1)

The major point in classifying Federal libraries by type is to illustrate the wide range of interests and clientele served by Federal libraries. These data also illustrate that Federal libraries may have more interests and requirements in common with non-Federal libraries of the same type than they do with other Federal libraries.

Size of Collections. The median respondent had a total collection of 16,500 holdings of all types. The first quartile is 9000; the third quartile is 33,000. The reported range of collections was from 300 to 10,000,000 (Question 4). In the latter case, the 10,000,000 holdings were mostly foreign patents rather than traditional library materials; nevertheless, they require some amount of bibliographical control. Based on this evidence, the majority of Federal libraries would be classified as "small" libraries, with only a small percentage of the total having collections approaching those of large public and university libraries.

Table IV-1 breaks these collections down by type of materials. The largest holdings are in book materials and almost all respondents reported book holdings. However, it is interesting to note that from 35 to 53 percent of the respondents report holdings of less traditional materials, including audio recordings, maps, charts, technical reports, internal reports, pictures, and films.

Respondents were asked to evaluate the importance of various types of materials to their users. Table IV-2 shows the ranking of the most important materials. In view of the fact that 501 respondents considered themselves to be predominently technical, special, or research libraries, this ranking shows a surprising affirmation of the importance of book materials and serial holdings and a comparatively low ranking for technical reports and government documents. Table IV-1 indicated that 603 respondents have government documents in their collections, yet only 90 respondents ranked or rated them as of first or

TABLE IV-1. TYPES OF MATERIALS AND NUMBER OF TITLES HELD (Question 5)

Type of Material	N	Number of Respondents				
		Under 5000	5000-20,000	20,001-50,000	50,001 200,000	Over 200,000
Books	929	280	454	137	46	12
Serials	877	827	34	12	4	
Government documents	603	528	46	14	11	4
Pamphlets and reprints	591	546	36	6	2	1
Phonorecords, tapes, etc.	523	511	11		1	
Maps and charts	520	502	10	5		3
Technical reports	491	375	57	21	21	17
Internal reports	376	341	22	7	4	2
Pictures	363	345	12	2	3	1
Films	354	344	6	1	2	1

TABLE IV-2. RESPONDENTS' RANKING OF IMPORTANCE OF MATERIALS HELD (Question 5)

Type of Material	Ranking By Respondents[1]				
	1	2	3	4	5
Books	494	135	50	22	6
Serials	125	371	87	44	20
Technical reports	46	33	67	42	22
Government documents	30	29	83	85	63
Phonorecords	1	27	172	66	31
Pamphlets	4	10	60	83	77
Internal Reports	10	12	13	23	26

[1] A ranking of 1 was used for most important materials, etc.

second importance; similarly, 491 respondents have technical reports and only 107 ranked or rated them as of first or second importance.

Another surprising finding was the relatively low percentage of holdings in microform (Question 4). The median library had an estimated 2 percent of its holdings in microform; the first quartile was 1 percent; the third quartile was 10 percent. The range was 1 to 97 percent.

Budgets. As illustrated in Table IV-3, the median respondent spent less than $27,000 for materials, staff, and equipment in fiscal year 1970. For the first quartile the total was less than $14,225; for the third quartile less than $48,350. About 34 percent of the respondents reported additional funds for contractual services, but even the third quartile in this category was only $3,525. About 16 percent of the respondents reported "other" funds; the third quartile was $3,500 for this category. These funds were reported as being used for translations, photocopying, training, travel, and similar expenditures. The total budget reported by all respondents was $60,640,208, about two-thirds of which is devoted to personnel. Because of the preponderance of labor expense, and of one- and-two-staff-member libraries, there is reason to expect that automation offers at best only a modest potential for overall cost reduction, and that this will occur primarily in the larger libraries.

Based on these data, the total Federal expenditures for library service were estimated as shown in Table IV-4. A low-range estimate was made assuming that the total Federal library community is near the 2100 reported in the Roster and that nonrespondent libraries are similar in funding patterns to respondents. A high-range budget was estimated using all the above data, but assuming that the total number of Federal libraries is 2500 (many knowledgeable people assume that there are many Federal libraries as yet unlisted in FLC rosters and lists).

TABLE IV-3. 1970 EXPENDITURES BY CATEGORY FOR ALL RESPONDENTS
(Question 6)

Category	N	Total Expenditures	Median	First Quartile	Third Quartile	Range[1]
Materials	825	$15,414,998	$ 6,000	$ 2,925	$12,000	$25-$2,200,000
Personnel	769	37,361,777	20,000	11,000	34,347	1- 2,800,000
Equipment, Supplies	708	2,261,139	757	300	2,000	5- 100,000
Contractual Services	274	4,023,950	1,200	500	3,525	10- 2,000,000
Other	128	1,578,344	867	435	3,500	10- 576,500

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[1] The ranges shown here have been verified against the actual data given by respondent.

TABLE IV-4. ESTIMATED TOTAL FEDERAL LIBRARY BUDGET

Low-range: Assumes 2100 libraries plus national libraries

Category	Number of Libraries	Actual or Estimated Budget
Survey respondents providing budget data	825	$60,640,208
USIA libraries	138	1,848,961*
All other Federal libraries	1,139	31,830,100**
Library of Congress	1	57,483,814***
National Library of Medicine	1	20,321,259
National Agricultural Library	1	2,500,000
Estimated total		174,624,342

High-range: Assumes 2500 libraries plus national libraries.

Estimated total for 2100 libraries and national libraries	= 174,624,342
Estimated total for 400 unidentified Federal libraries	= 10,918,020****
Estimated total	185,542,362

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*Only 3 USIA libraries responded to the survey. Total materials and miscellaneous budget for the 138 USIA libraries, supplied by USIA headquarters, was $1,158,961. Most of these libraries are one-staff operations, manned by local nonprofessionals, and are budgeted by individual USIA posts. Total staff budget was estimated by SDC to be $690,000 (at $5,000 average per library).

**Since nonrespondents were largely the smaller libraries, estimate was based on the median for each budget category; for contract and "other" expenditures, estimates were based following the percentage of respondents reporting that category. Estimate includes $6,882,000 for materials, $22,940,000 for staff, $860,709 for equipment and supplies, $464,400 for contractual services (34 percent of total) and $147,390 for other (15 percent of total).

***The budgets for the three national libraries are as reported by the libraries to the SDC project team. The LC budget includes only Federal funds.

****Based on medians for all budget categories. Includes $2,400,000 for materials, $8,000 for staff, $302,800 for equipment and supplies, $163,200 for contractual services (34 percent of libraries) and $52,020 for other (based on 15 percent of libraries).

Staff. The current staffing reported by respondents is shown in Table IV-5. This table clearly demonstrates the nature of the Federal library community as one in which the typical library has one librarian who may or may not be professional and who, in many cases, has no supporting staff. Yet most of these librarians must perform local cataloging, order materials, handle serials check-in and renewal, perform reference services, and handle local and interlibrary loan requests, as well as the many other functions described in detail in the Appendix. Many respondents used this survey as a vehicle for describing some really desperate situations, for example, a single librarian trying to provide recreational and training materials for hundreds of institutionalized military personnel undergoing rehabilitation.

The professional staff group largely comprises those qualified under the 1410 librarian series. Information specialists (1412 series) were reported by only 37 respondents; a wide range of other professional series was reported, e.g., 1084, Visual Information Series, and 1015, Museum Curator Series (a full listing is provided in Question 7 in the Appendix). The data were tallied by type of personnel and the totals obtained are shown in Table IV-5.

Exclusive of contractual labor, then, professional librarians constitute slightly more than 37 percent of the total work force; other professionals constitute 6 percent; subprofessionals about 30 percent; and clericals slightly more than 26 percent. The ratio of 1410 professionals to other professionals is 5.4 to 1. The overall ratio of professional labor to nonprofessional labor is about 1 to 1.3. Many library authorities recommend that professionals be supported by from 3 to 5 subprofessionals and clerks; in this respect, Federal libraries fall short of recommended standards.

Since the ratio of professional to nonprofessional is so low and since 302 respondents were one-staff-member libraries, little nonprofessional labor can be eliminated if Federal libraries are to function at all. It is in reducing

TABLE IV-5. CURRENT STAFF (Question 7)

Personnel Categories	N	Total Staff	Number of Staff			
			Median	First Quartile	Third Quartile	Range
Professional						
1410 Series	764	1,738.2	1.0	1.0	2.0	0.5-37.0
1412 Series	38	150.5	1.0	1.0	2.0	1.0-88.0
Other	55	166.5	2.0	1.0	3.0	0.5-20.0
Subprofessional	465	1,367.5	1.0	1.0	3.0	0.5-40.0
Clerical	469	1,230.5	1.0	1.0	2.0	0.3-40.0
Contractual	28	80.5	1.0	1.0	2.0	0.5-18.0

nonprofessional labor requirements that automation provides cost reduction benefits. Since the current manning level is close to the minimum possible (someone must spend time on--and be responsible for--any library collection), it is clear that automation can benefit the Federal libraries largely through improvement of services rather than reduction of operating expenditures. Given the present state of automation technology, it is possible to improve services by employing a network to provide sophisticated bibliographic skills and resources to augment the local staff capability. In the future, the use of Federal communications satellite systems for Federal libraries should be explored.

Communication. The primary current communication modes used by Federal libraries are mail, commercial telephone, and Federal telephone nets. Very few libraries use a teletype net and only 14 use facsimile transmission (Question 50). A question on the value of Federal telephone networks was answered by 749 respondents. The availability of these networks had moderately or greatly improved services to patrons of 67 percent of the respondents, while 30 percent found slight or no improvement. Some libraries in the latter group may have restricted access to Federal telephone nets. Twenty libraries reported that they have no access, and it may be that the more than 200 nonrespondents to this question also fall into this category.

Administrative Characteristics

On the 913 respondents to a question concerning administrative relationships among Federal libraries, 63 percent reported that they were not under the administrative control of another Federal library; the remainder (except for several libraries that were administered jointly or in part by a non-Federal library) were administratively related (Question 2). These existing administrative relationships could significantly aid in the extension of some kind and amount of automation support to the Federal library community.[1]

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[1] However, some respondents who indicated that they were under such administrative control volunteered the information that the relationship was unclear or virtually non-existent.

Almost a quarter of the respondents reported they had branches or separately housed reading rooms. The number of these additional outlets ranged from 1 to 33 and averaged 1 to 3. Such collections may require duplication of some portion of a library's bibliographic control apparatus. This may be an area in which automation could provide assistance.

One potential problem area in developing centralized automation or other services for Federal libraries is the degree of authority exercised by librarians over their operations. It is hard enough to establish the cooperative and semi-centralized management necessary for cost-effective operation when only the librarians themselves are involved; if other levels of decision-making and approval must be added to the management structure for a cooperative effort, then it becomes much more difficult to establish and maintain service centers or networks. An additional source of potential difficulty may arise when the person holding approval authority over library functions or policies is not a librarian, since a person may lack the experience or understanding necessary to make appropriate decisions on library questions.

Table IV-6 shows the degree of authority granted to the respondent librarians; the extent to which higher-level approval comes from librarians is also shown. The data show that Federal library administration is largely centered within the library and its local agency, thereby indicating the necessity for educational and information programs aimed at local agency administrators as well as those in central agency positions. Except in minor instances, higher agency administration becomes involved only in policy (as opposed to operational) decisions. This involvement is greater for automation and relatively lower in other areas.

TABLE IV-6 . APPROVAL REQUIRED FOR VARIOUS FUNCTIONS OR POLICIES (Question 9)

Function or Policy	N*	Percentage of Respondents in Approval Category			
		Respondents Have Approval Authority	Approval Authority at Local Agency Level Required	Approval Authority above Local Agency Level Required	Approvers outside Local Library Who are Librarians
Reference service policy	923	84	6	6	36
Circulation policy	966	76	17	7	18
Selection of materials	922	80	12	8	28
Technical processing policy	827	75	8	17	45
Purchase of materials	977	52	36	12	19
Personnel administration	743	43	44	13	5
Automation planning	595	23	36	41	16

*Responses may add up to more than the 964 librarians in the data base because a few respondents checked more than one level.

Interlibrary Relationships

Library Networks. A total of 101 respondents reported that their libraries participated in formally established cooperative groups or networks (extending beyond agency boundaries) to provide mutual support and assistance (Question 10). Most of these groups are quite small--10 libraries or fewer. However there are also several agency cooperative groups or networks that include fairly large numbers of libraries. For example, the Veterans Administration libraries, of which there are almost 200, receive some centralized services such as cataloging from the Headquarters Library.

Most networks to which respondents belong include only one kind of library; there are few occurrences of groups that include, for example, both non-Federal and Federal public libraries. Some networks cover a fairly extensive area, as evidenced by the 71 percent of the respondents who reported (Question 4) that most of the other libraries in their networks were outside the immediate local area (defined as a 50-mile limit).

As illustrated in Figure IV-3, the networks that cross agency lines are concentrating their efforts on the centralization of functions relating to bibliography, cataloging, acquisitions, and the maintenance of a union list of holdings. However, training, reference, and other technical processing services are also provided in some networks.

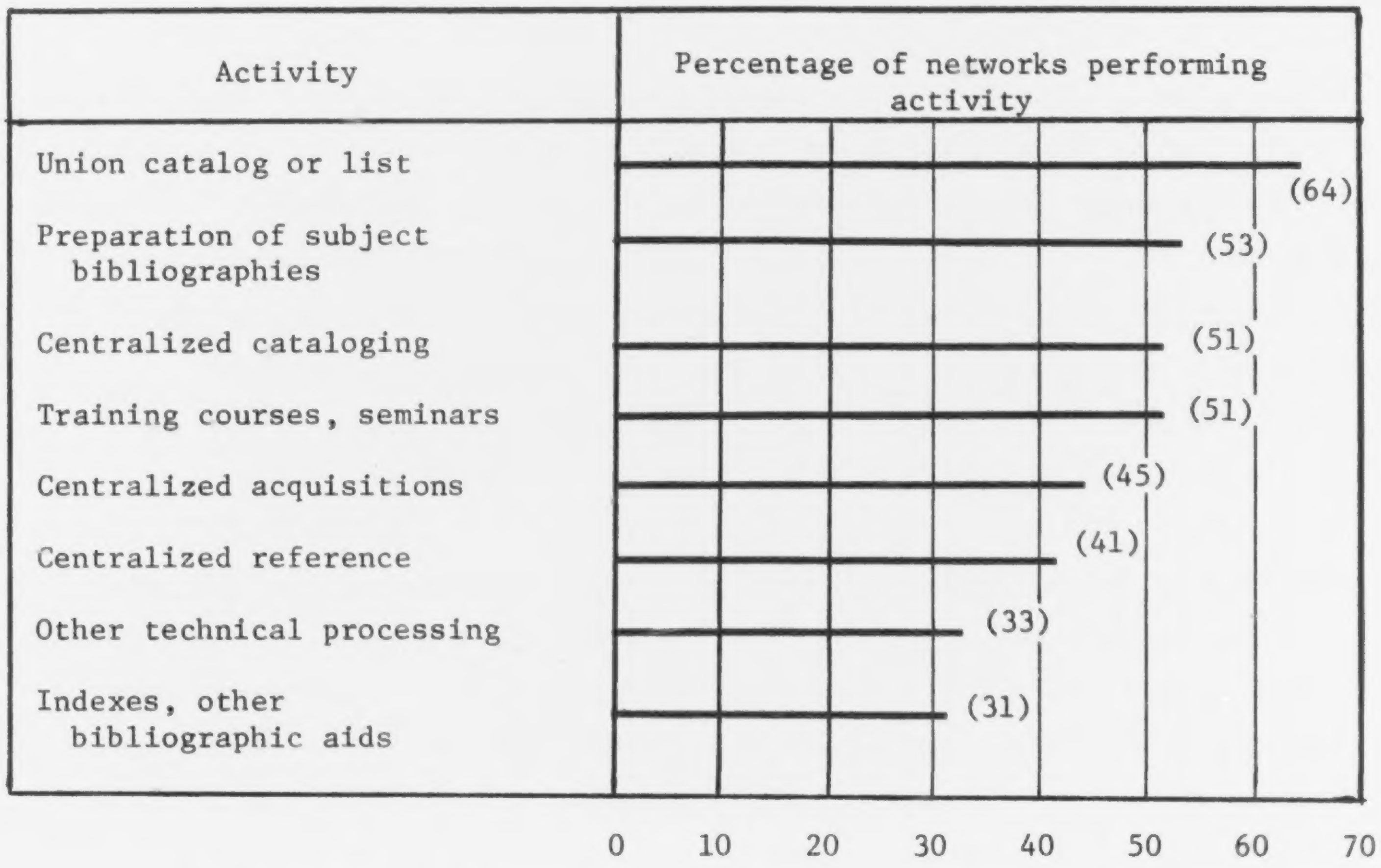

Figure IV-3. Activities Performed or Planned in Non-Agency Networks in Which Respondents Participate (Question 14)

Informal Interaction with Other Libraries. As might be expected by the findings, which show the small local collections and staff available to the majority of Federal libraries, outside resources are used extensively to support local activities. Thus Federal libraries are active participants in interlibrary loan, exchange of materials, reference assistance, and photocopying activities. As illustrated in Table IV-7, the national libraries are important sources for other Federal libraries.

TABLE IV-7. RESPONDENTS' INTERACTION WITH NATIONAL LIBRARIES (Question 8)

Activity	Number of Respondents Interacting with:			
	LC	NLM	NAL	Foreign National Libraries
Interlibrary loan	266	223	113	48
Photocopying	104	130	54	27
Reference assistance	110	86	36	27
Exchange of materials	79	19	13	40

Interlibrary loan is the major form of interaction among Federal libraries. There is a tendency, as shown in Table IV-8, to interact more with local libraries than with nonlocal libraries. The pattern of interlibrary loan activity is not restricted along organizational lines, except perhaps for non-Federal governmental libraries (such as State libraries), this is shown by the nearly equal figures for each kind of cooperating library. A similar pattern is shown in reference assistance activity, although the amount of interaction is approximately 60 percent of that for interlibrary loan. copying also follows the same pattern, with an activity rate approximately 40 percent of that for interlibrary loan.

TABLE IV-8. RESPONDENTS' INTERACTION WITH OTHER LIBRARIES BY ACTIVITY (Question 8)

Kind of Library	Number of Respondents Interacting with:	
	Libraries within Local Area	Libraries outside Local Area
INTERLIBRARY LOAN		
Other libraries in own agency	464	417
Other Federal libraries	459	384
Non-Federal governmental libraries (e.g., state libraries)	375	278
Non-governmental libraries	497	399
PHOTOCOPYING		
Other libraries in own agency	186	190
Other Federal libraries	194	173
Non-Federal governmental libraries (e.g., state libraries)	134	115
Non-governmental libraries	205	180
REFERENCE ASSISTANCE		
Other libraries in own agency	293	230
Other Federal libraries	263	186
Non-Federal governmental libraries (e.g., state libraries)	181	121
Non-governmental libraries	286	274
EXCHANGE OF MATERIALS		
Other libraries in own agency	281	231
Other Federal libraries	186	142
Non-Federal governmental libraries (e.g., state libraries)	90	66
Non-governmental libraries	122	80

A somewhat different pattern appears for exchange of materials. In this activity, other libraries within the same agency take on greater importance, and Federal libraries are much less likely to interact with nongovernmental libraries. However, there is still the same tendency toward interacting more with local libraries than with distant ones.

Interaction for catalog cards or other cataloging support is heavily oriented toward the Library of Congress and toward libraries within the same agency. However, as shown in Table IV-9, interaction occurrences are very low, which may indicate that many Federal libraries are proceeding independently in cataloging.*

A few respondents reported obtaining assistance for systems analysis, design, and programming. Other libraries within the same agency were used most frequently for this automation support. The sources of such support and the number of respondents using each source were:

- Other libraries in own agency: 17
- Other Federal libraries: 7
- Non-Federal governmental libraries: 2
- Non-governmental libraries: 8

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*The only measure of use of LC cataloging was derived from Questions 8 and 23 which revealed that 459 respondents had LC cards in their cataloging. Therefore, no data were captured for libraries that might prepare cards locally from LC proofslips or other copy, or for those that receive centralized catalog services deriving from LC cataloging.

TABLE IV-9. RESPONDENTS' INTERACTION WITH NATIONAL AND OTHER LIBRARIES FOR CATALOGING SUPPORT (Question 8)

Kind of Library	Number of Respondents Interacting for Cataloging Support	
Library of Congress	311	
NLM	16	
NAL	4	
Foreign national libraries	5	
	Local Libraries	Nonlocal Libraries
Other libraries in own agency	76	77
Other Federal libraries	15	10
Non-Federal governmental libraries (e.g., state libraries)	8	1
Non-governmental libraries	9	7

FUNCTIONS PERFORMED BY FEDERAL LIBRARIES

A number of questions were posed to Federal librarians to obtain detailed data describing the performance of library functions. Gathering such data served two major purposes: to establish the scope of activities categorized by the common library terms of cataloging, circulation, etc., so that comparisons could be made among libraries; and to investigate the degree of diversity in library operations that must be accommodated by automated systems. Since the primary focus of the questionnaire was to determine the potential for automation, the functions included were restricted to those most amenable to automation, i.e., cataloging, acquisitions, serials, circulation, and certain aspects of reference service. These are discussed in the following sections.

Cataloging

Responses relating to cataloging (Question 23) indicated that most respondents (643) use a dictionary catalog; of these catalogs, only 31 are bookform. Divided catalogs are used by 203 respondents; 15 of these catalogs were bookform. Most book catalogs result from automated systems and are primarily used where distribution of the catalog outside the library is desirable.

Shelflists are maintained by 793 libraries in cardform, and by 31 libraries in bookform. Subject cross-references are more likely to be included in catalogs than are name cross-references (in 644 vs 486 libraries). Only 295 libraries maintain subject authority files and 199 maintain name authority files. Serial titles are included in the catalogs by only 264 respondents.

About two-thirds of all respondents use Library of Congress catalog cards directly; about 60 percent use LC catalog data in preparing local cards to supplement--or replace--LC cards. Thus, even with the heavy reliance on LC cataloging, a large amount of local cataloging or local retyping of catalog data is being performed in Federal libraries. For example, 352 respondents have catalogs that consist largely of locally prepared, i.e., typed or duplicated, catalog cards. The reasons for this local cataloging need further exploration. In responding to a question about cataloging problems (Question 30), 205 respondents noted that LC cataloging was too slow for their use, while only 116 noted that LC cataloging omitted some of their major acquisitions. To obtain LC copy, one must have the requisite bibliographical tools (many of which may cost more than small libraries can afford) and the skilled staff to use such tools; 174 respondents specified that searching for catalog data was hampered by lack of trained staff.

One hundred respondents provide copies of locally produced cards to a union catalog, but of these only 22 submit cards to the National Union Catalog. Only 105 libraries include the Library of Congress card number on locally produced catalog cards, and only 51 include the Standard Book Number. This, in view of the likelihood of increased automation, is unfortunate, since these numbers serve to identify a title uniquely in computer-based cataloging systems. Such numbers provide a quick and inexpensive means of determining what titles may be included in MARC or some other machine-readable catalog record, thereby aiding greatly in the conversion of catalog to machine-readable form.

As illustrated in Table IV- 10, certain materials are more likely to be fully cataloged than others and some are likely to be uncataloged. If materials are in microform rather than hardcopy, they are more likely to be cataloged briefly or not at all. Given the small size of most Federal libraries, cataloging may be less important than in other libraries; nevertheless, it is probably desirable to increase the proportions of fully or briefly cataloged materials--particularly when they are in microform--in order to improve access to local collections.

TABLE IV-10. TYPE OF MATERIAL BY PERCENTAGE OF RESPONDENTS PROVIDING FULL, BRIEF, OR NO CATALOGING (Question 24)

Type of Materials	Percentage of Respondents Providing:		
	Full Cataloging	Brief Cataloging	No Cataloging
Books	79	21	0
Books (microform)	46	16	38
Government documents	39	41	20
Government documents (microform)	40	20	40
Technical reports	38	37	25
Technical reports (microform)	35	21	44
Internal reports	33	32	35
Internal reports (microform)	36	19	45
Manuscripts, lab notes	18	30	52
Manuscripts (microform)	28	16	56
Phonorecords	25	57	18
Serials	18	48	34
Serials (microform)	24	33	43
Specifications	11	30	59
Specifications (microform)	19	23	58
Films	19	46	35
Maps and charts	12	39	49
Pictures	9	42	49
Models and displays	4	26	70
Pamphlets	15	50	35

Figure IV-4 shows cataloging products used by the respondents (Question 27). The 217 respondents reporting use of book catalogs or index listings are primarily developing specialized indexes for certain materials; only 46 book catalog systems were identified.

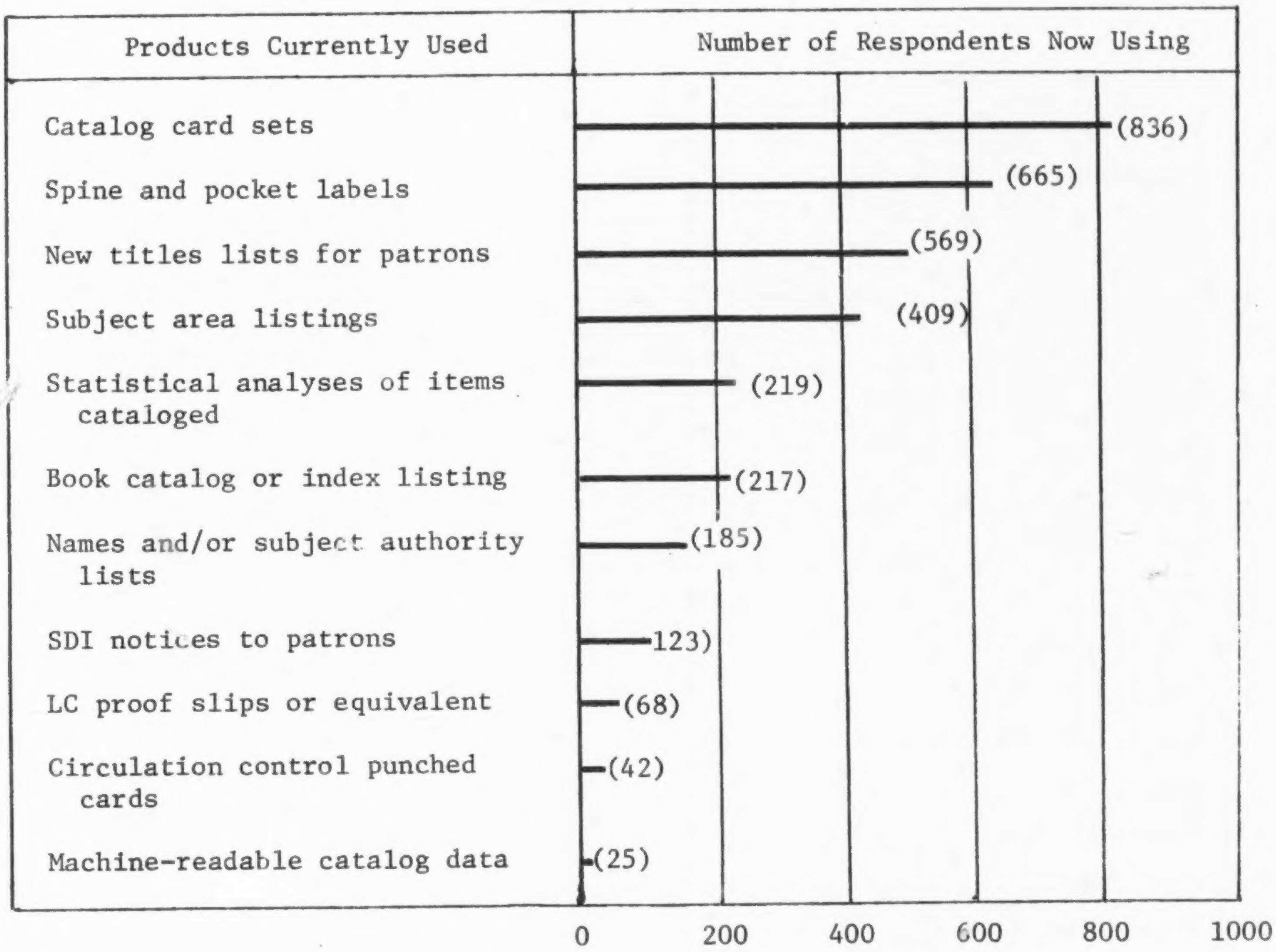

Figure IV-4. Cataloging Products Currently Used by Respondents (Question 27)

Respondents were asked to estimate the minimum and typical times required to catalog materials or to obtain cataloging from an outside source (Question 28). The minimum time reported by the majority of respondents (481) was "within 2 weeks." The minimum time for 16 percent of the respondents is more than 1 month. However, minimum times reflect what the library can do when pressed; typical times are much more indicative of the local cataloging operation. The majority of respondents (234) reported typical cataloging times of "more than 2 weeks but less than 1 month." However, 11 percent have typical cataloging times of more than 3 months, and some respondents noted cataloging times that, on the average, are greater than 1 year.

Acquisitions

Materials are acquired by Federal Libraries in a variety of ways, including both local ordering and centralized ordering and distribution (Question 32). However, even though 497 respondents acquire materials from a central Federal library, only 125 respondents order all their materials centrally. As Table IV-11 shows, the bulk of order activity remains local. Although the data base was not manipulated by type of library for this question, the largest category of libraries using central order service are probably the overseas school libraries.

Of the respondents who order materials locally, 60 percent use multiple funds; the remainder have only a single book fund. This contrasts sharply with non-Federal libraries, which usually have a large number of funds to manage that reflect departments, types of materials, gift funds, etc. Approximately 29 percent of the libraries performing acquisitions activities must follow a bidding procedure to purchase materials.

The lack of standardization in procurement forms is shown by the number of different forms currently in use (Question 31):

- 564 use a procurement form that is an agency standard for the purchase of all kinds of supplies

- 326 use a form that is an agency standard for the purchase of library materials
- 134 use a form provided by commercial library supply houses
- 97 use a form developed for the library's own use
- 52 use none of these forms

TABLE IV-11. PERCENTAGE OF TOTAL ACQUISITIONS BY ACQUISITION CHANNEL (Question 32)

Acquisition Channel	N	Percent of Total Acquisitions: 1 - 10 Percent	11-50 Percent	51-90 Percent	91-100 Percent
		Number of Respondents			
Individual orders from library	817	55	191	277	294
Automatically received from agency	437	248	140	43	6
Ordered or selected by central agency	302	96	100	63	43
Exchange materials	185	141	37	7	0
Automatically received from GPO	155	134	16	5	0
Blanket order dealers	74	27	28	14	5

Although at least 557 respondents are using order forms designed for ordering bibliographic materials, 564 respondents still use procurement froms that are not suitable for describing such materials. However, the fact that many Federal libraries do use library order forms should make it possible to obtain the necessary leverage to develop a governmentwide library order form

Most respondents experience a lengthy delay between ordering and obtaining materials (Question 34). Out of 824 respondents, 49 percent typically receive materials 1 to 3 months after ordering, and 34 percent reported typical times of over 3 months. The minimum times required when procurement is expedited were 2 weeks or less for 212 out of 785 respondents, and within 1 month for 210 respondents. However, for 160 libraries the minimum time was still more than 3 months. The extent to which automation could help speed up this process depends upon the source of delay. In some cases, it is undoubtedly due to agency requirements for approval and for procurement of bids; in other cases delay is caused because materials must be obtained for shipment to libraries overseas.

Figure IV-5 shows the acquisitions operations currently performed by the respondents. The operations with a low rate of performance, e.g., vendor performance analyses and fund accounting, are those that an automated system could provide more efficiently.

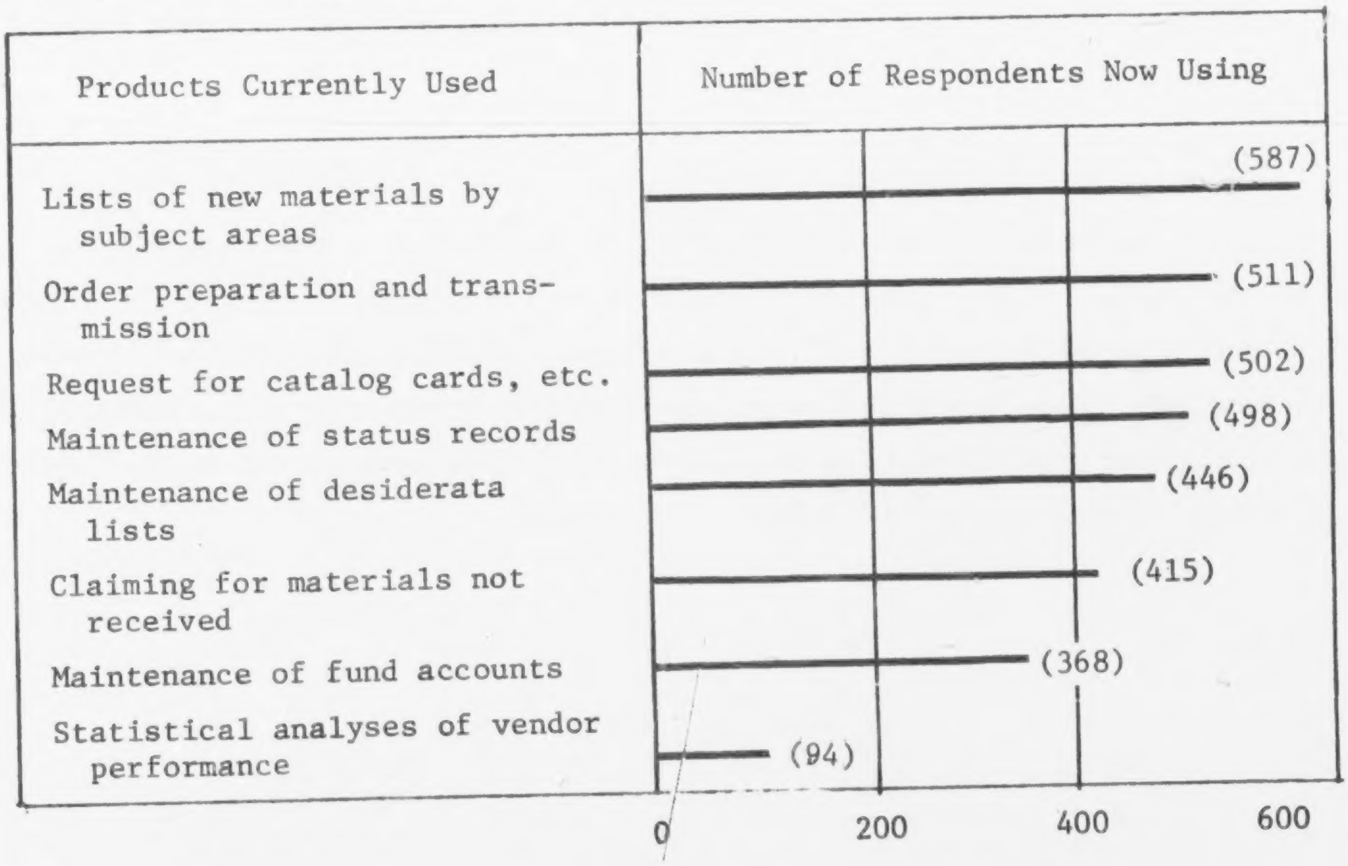

Figure IV-5. Acquisitions Operations Currently Performed by Federal Libraries (Question 35)

Serials

Approximately one-quarter of the respondents retain most of their serials and periodicals permanently; the remainder either hold serials for a specific time period or discard them when they are no longer being used (Question 37). Thus, the cataloging and binding functions of serials control are probably as important for the majority of Federal libraries as they would be, for example, in colleges and university libraries.

Almost half of the respondents catalog serials, although only 149 out of 545 provide full cataloging (Question 24). Of those who catalog, one-third include the majority of serial titles in the general catalog, while the other two-thirds maintain a separate serials catalog (Question 37). Some 98 respondents catalog only the most important serials, and 74 include technical reports in the serials catalog (Question 37). In considering the possibility of providing centralized cataloging assistance for the serials function, it appears that a brief form of catalog record would suffice for most Federal libraries.

About half of the respondents place serial orders directly with a dealer or publisher, or receive serials as a gift or exchange, in the proportions shown in Table IV 12 . Only 10 percent of the respondents are in the fortunate position of being able to place orders on an "until cancelled" basis; the remainder must renew subscriptions annually (Question 37). This policy signifies that any automation of the reordering process might be most welcome and would save considerable labor.

TABLE IV-12. PERCENTAGE OF SERIALS RECEIVED FROM SUBSCRIPTION SOURCES BY RESPONDENTS WHO ORDER SERIALS LOCALLY (Question 38)

Subscription Source	N	Percentage Received from Each Source		
		First Quartile	Median	Third Quartile
Serial dealers	449	75	90	90
Publishers	443	10	40	90
Gift or exchange	342	5	10	20

Figure IV-6 shows the serials operations currently performed by respondents. The prevalent local operation is, of course, check-in of new issues. Other operations are reported by fewer respondents, since some of these are performed centrally (e.g., maintenance of order and renewal files), and some are not performed at all (e.g., maintenance of bindery records), inasmuch as many libraries do not retain serials permanently. The response for "maintenance of a union list of serials" seems very high: it implies that about 1 out of every 4 survey respondents maintains a union list. The respondents might have misinterpreted the question, or it may be that many very small union lists incorporating holdings of a few libraries are being maintained.

Circulation

While 42 percent of the respondents lend materials to any library that requests them, only 23 percent lend to the general public. The rest of the libraries restrict their circulation in some way, either to governmental libraries, Federal libraries, or staff and libraries within the lending library's own agency or department. Fourteen percent of Federal libraries lend only to staff in their local agency (Question 41). Thus, development of standardized automated circulation systems would have to take into account these various circulation policies. Since most non-Federal libraries that have automated circulation control systems employ similar borrower categories and restrictions, this should cause no difficulty.

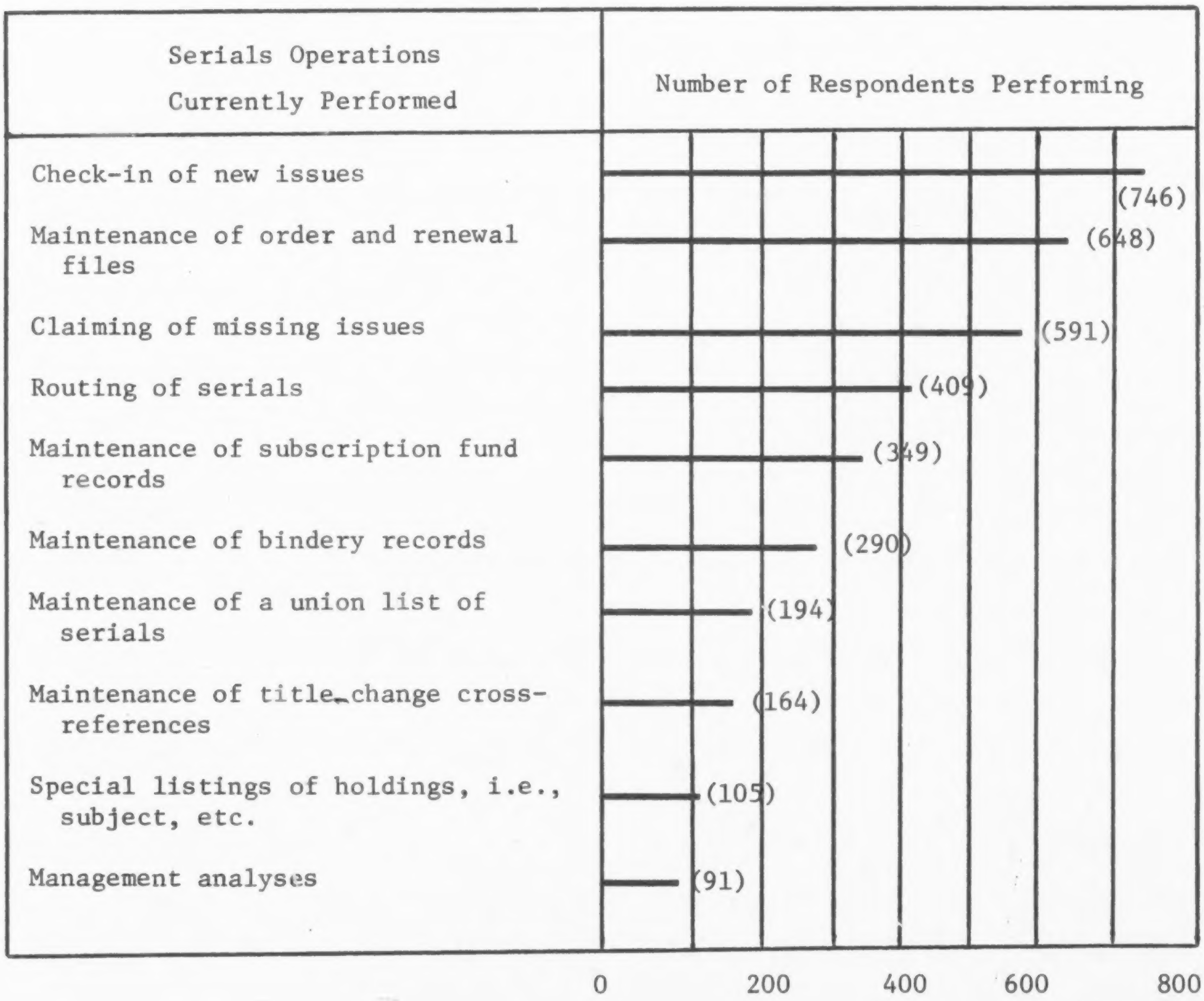

Figure IV-6. Serials Operations Currently Performed by Federal Libraries (Question 40)

Table IV-13 shows the volume of circulation activity in Federal libraries. Books and periodicals are circulated most frequently in most libraries. In few libraries does total circulation reach levels at which automation might produce significant savings in labor. However, it is likely that the value of being able to identify where a particular item is located is sufficiently high in many Federal libraries to warrant the expense of automation. This would be particularly true of the 17 percent of Federal libraries that handle classified material (Question 43).

The median holdings for books was 16,500. If we assume that the median circulation was about 200 per week, then the total median annual circulation is about 10,400. This is a circulation-to-total-holdings ratio of about 1 to 1.6 for the median library. These data suggest that the use of Federal libraries is relatively high compared to their overall size and considering the nature of the libraries (e.g., in contrast to college and university libraries, where many patrons have "required" reading lists, reserve books, etc.).

Figure IV-7 illustrates the circulation control functions that Federal libraries currently exercise. Most of these systems are relatively simple; for example, only 376 out of 755 allow search of the circulation file by the borrower. Although Federal libraries eliminate some of the problems experienced by non-Federal public and educational libraries, such as collection of fines and constant turnover of library clientele, some problems are unique. These include control over security classified documents, which involves the patron's security classification, security of storage areas, and update of records to reflect changing security status as materials are reclassified.

TABLE IV-13. WEEKLY CIRCULATION BY TYPE OF MATERIAL AND PERCENTAGE OF RESPONDENTS IN TRANSACTION RANGES (Question 42)

Type of Material	N	Percentage of Respondents within Indicated Weekly Transaction Range				
		1-200	201-500	501-1000	1001-2000	over 2000
Books; bound periodicals	837	50	22.0	13.0	10.0	5.0
Serials	740	87	10.0	1.3	1.0	0.7
Pamphlets	425	98	1.6	0.3	0.1	--
Phonorecords	402	83	13.0	3.8	0.1	0.1
Government documents	401	95	3.0	1.9	0.1	--
Technical reports	338	91	6.0	2.0	1.0	--
Maps, charts	271	99	0.8	--	0.1	0.1
Films	190	94	4.0	2.0	--	--
Pictures	165	97	2.0	0.5	--	0.5
Materials sent on ILL	496	99	0.6	0.4	--	--
Materials received from ILL	550	98	2.0	--	--	--

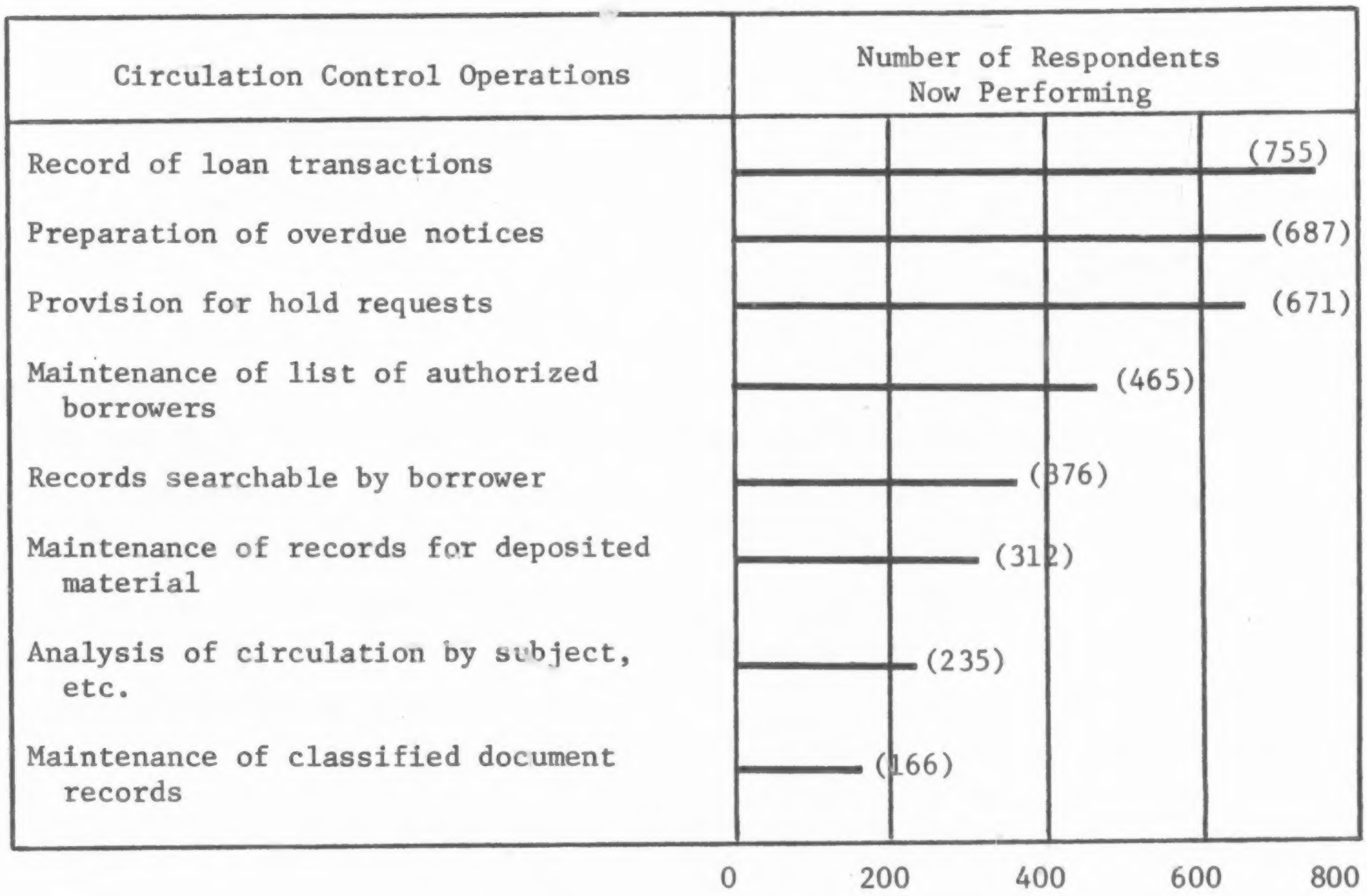

Figure IV-7. Circulation Control Operations Currently Performed by Federal Libraries (Question 43)

Reference

Because this study dealt largely with the automation potential in Federal libraries, questions dealing with reference services focused on functions wherein automated support might be used: abstracting and indexing, information retrieval, and dissemination.

Although 26 percent of the librarians reported performing an abstracting and indexing function (Question 15), only 5 percent did so on a regular basis

(Question 45). Of these latter libraries, most did the work for local use only, but several supplied their services to other libraries and agencies. Three libraries contracted with non-Federal organizations for indexing and abstracting services, while two others contracted such work with Federal agencies. It appears, therefore, that automation support for abstracting and indexing should be accorded a low priority.

A relatively high proportion--27 percent--of Federal librarians reported making use of information retrieved from machine-readable data bases (Question 46). The major data bases, and the number of Federal libraries using them (Question 49), are listed in Table IV-14. In preparing the questionnaires for coding, it was necessary in some cases to eliminate responses to Question 49 which indicated that the library was using the hardcopy and not the machine-readable data base. Thus the data in Table IV-14 are as accurate as correlation of responses with related questions (e.g., 46, 47, and 48) permits.

Searches were usually made in response to an individual patron's request. In most cases (174) the libraries prepared a written, formatted, search request; unformatted search requests were used by 82 libraries. In addition, 16 respondents reported using an on-line terminal for data base searches (Question 47). The majority of respondents (191) access outside data bases less than 25 times per month; 14 make from 26 to 50 searches per month, and 14 make more than 50 searches. Since none of the respondents to this survey can be classed as large libraries (in comparison with universities and large public libraries) it is probable that no other group of libraries of comparable size in the country make such an intensive use of machine-readable data bases. For example, many large public and university libraries with far greater resources do not yet provide these services to their patrons. It is perhaps in this area that Federal libraries, as a group, are in the vanguard. Certainly more information about the methodology and experiences of these data base uses should be obtained and reported to the library community.

TABLE IV-14. NUMBER OF RESPONDENTS USING NON-LOCAL DATA BASES (Question 49)

Data Base	Number of Respondents
MEDLARS	139
DDC	122
NASA data bases	53
ISI data bases	52
Chemical Abstracts	33
Engineering Index	30
Biological Abstracts	28
MARC	22
ERIC	16
AIM-TWX	12

Although one-third of the respondents performed a selective dissemination of information function (SDI) of some type, only 66 respondents maintained SDI profiles for retrieving information from machine-readable data bases (Questions 15 and 48). Of the latter, 48 respondents maintained fewer than 25 profiles, and 10 libraries maintained more than 50. Thus, SDI, which is already an accepted service, might well be a fertile area for augmenting reference services with automation support.

Figure IV_8 lists reference services currently provided by respondents. It is interesting, in view of the many constraints under which the respondents operate, that so many are able to provide what are usually considered specialized services. It is possible that such services can be provided only because of the librarian's intimate knowledge of local agency staff needs; their provision otherwise would certainly require more expensive mechanisms than human memory and energy.

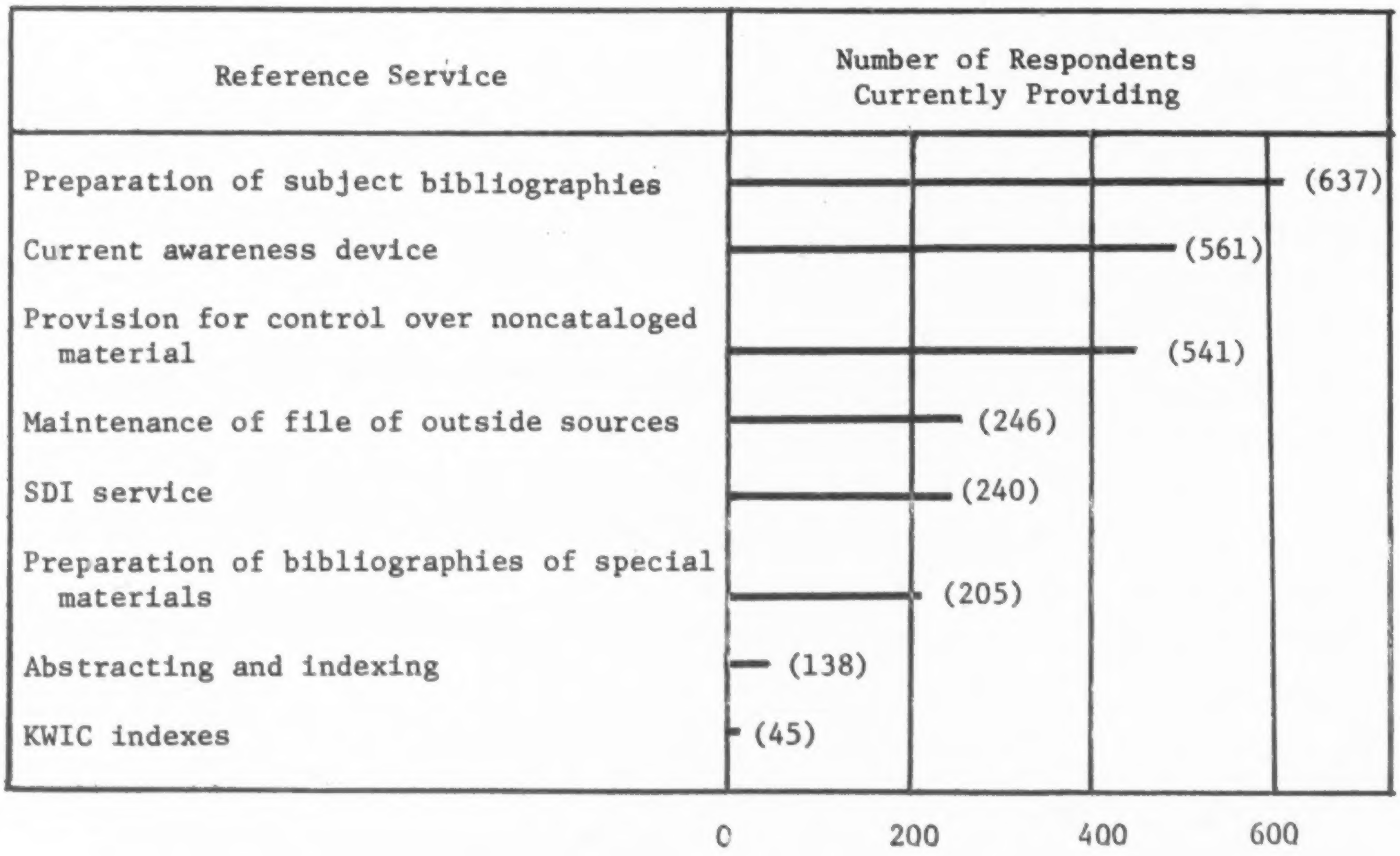

Figure IV-8. Reference Service Provided by Federal Libraries (Question 44)

PROBLEM AREAS

Several questions were asked to obtain information on the current level of quality and performance of Federal library services, and to provide the respondents with an opportunity to identify those areas in which automation might be most beneficial. Table IV-15 displays the results from a self-evaluation question.

The response to this question reveals that respondents tend to rate themselves as good or excellent in performing typical library operations and tend to rate themselves low in management aspects. For example, long-range planning, staff training, budgeting, staff recruiting, systems analysis, and automation planning were all rated as fair, minimal, or unsatisfactory by more than 50 percent of those who evaluated performance. This evaluation probably stems from two situations: (1) the respondents may have had more experience in library operations than in management operations, and (2) when staff resources are minimal, library operations must take precedence over other desirable--but not absolutely mandatory--functions such as long-range planning.

Respondents were asked to rank those library operations that most needed improvement. (The full data for this response are provided in Appendix Question 53.) The response shown in Table IV-16 contrasts somewhat with that shown in the previous Table IV-15 , since some of the operations needing improvement are those that are presently being performed in a manner rated "good to excellent." Note, however, that less than 50 respondents ranked control of government publications and technical reports as an area of first or second concern; this accords with earlier findings giving these materials a lower priority of importance to users. In addition, abstracting and indexing, rated low in this chart, are consistently given little importance in other ranking questions, as are systems analysis, automation planning, and control of audio-visual materials.

TABLE IV-15. SELF-EVALUATION OF CURRENT LIBRARY PERFORMANCE BY OPERATION (Question 52)

Library Operations	N	Percentage of Respondents in Evaluation Category			
		Good to Excellent	Fair	Minimal	Unsatis-factory
Catalog maintenance	856	64	29	5	2
Acquisition of materials	846	47	38	10	5
Material identification and selection	843	69	26	3	2
Circulation control	830	63	31	5	1
Locating materials for patrons	821	68	28	3	1
Reference services	805	54	35	9	2
Descriptive cataloging	705	53	32	14	1
Claiming missing items	677	29	43	19	9
Serials control	656	49	36	13	2
Subjects analysis, classification	620	54	34	9	3
Long-range planning	611	24	39	24	13
Fund accounting and control	606	53	25	14	7
Staff training	587	40	36	18	6
Budgeting	564	40	33	16	11
Information retrieval from collection	547	57	33	7	3
Control of technical reports, government publications	425	54	33	11	2
Staff recruiting	414	32	37	16	15
Control of audio-visual materials	399	45	36	15	4
Abstracting and indexing	239	42	21	27	10
Systems analysis, automation planning	179	17	21	36	26

TABLE IV-16. RESPONDENTS' RANKING OF LIBRARY OPERATIONS MOST NEEDING IMPROVEMENT (Question 53)

Library Operations	Number of Respondents' Ranking*				
	1	2	3	4	5
Ordering	105	60	39	39	24
Reference services	82	67	44	45	27
Cataloging	75	55	52	35	24
Reference collections	72	65	36	27	26
Clerical operations	60	34	27	26	22
Location of needed materials for users	46	38	54	30	17
Budgeting and accounting	45	35	22	20	17
Staff recruiting	45	22	25	11	11
Circulation control	39	44	39	27	21
Staff training	36	32	20	31	16
Planning and administration	33	24	24	24	17
Serial control (journals, series, etc., but not documents and technical reports)	22	23	19	18	22
Identification and selection of materials	24	29	35	21	24
Control of government publications or technical reports	20	14	7	17	9
Systems analysis and automation planning	18	15	14	6	7
Abstracting and indexing	14	11	27	18	12
Control of audio-visual materials	12	19	18	18	9

*1 = Operation most needing improvement, 2 = second most needing improvement, etc.

Figure IV-9 displays the librarians' response to a question concerning the problems inhibiting the improvement of existing services in the Federal Library community. The respondents clearly do not feel that lack of cooperation or lack of local planning are major factors. The compelling problems are staff shortages, inadequate budget, and inadequate physical facilities. Only the first two are confirmed by data in this study; specific data on physical facilities were not requested.

Specific questions were asked about cataloging operations, since cataloging is the heart of almost any library except the smallest. Figure IV-10 shows that no problem was identified by more than 260 respondents (about 27 percent of the total respondents to the survey). Three of the five problem areas noted by the most respondents are staff-related: consistency, keeping up with work load, and lack of trained staff for searching. Delay in receipt of LC cataloging was cited by 205 respondents; the new Cataloging in Publication program under development at LC may eliminate this problem for many libraries, since cataloging copy will be included in the book itself. Only 116 respondents specified that the bulk of their cataloging is not covered by the Library of Congress. This suggests that, for the majority of respondents, the Cataloging in Publication and use of MARC tapes could eliminate most local cataloging problems by maximizing use of centralized cataloging products.

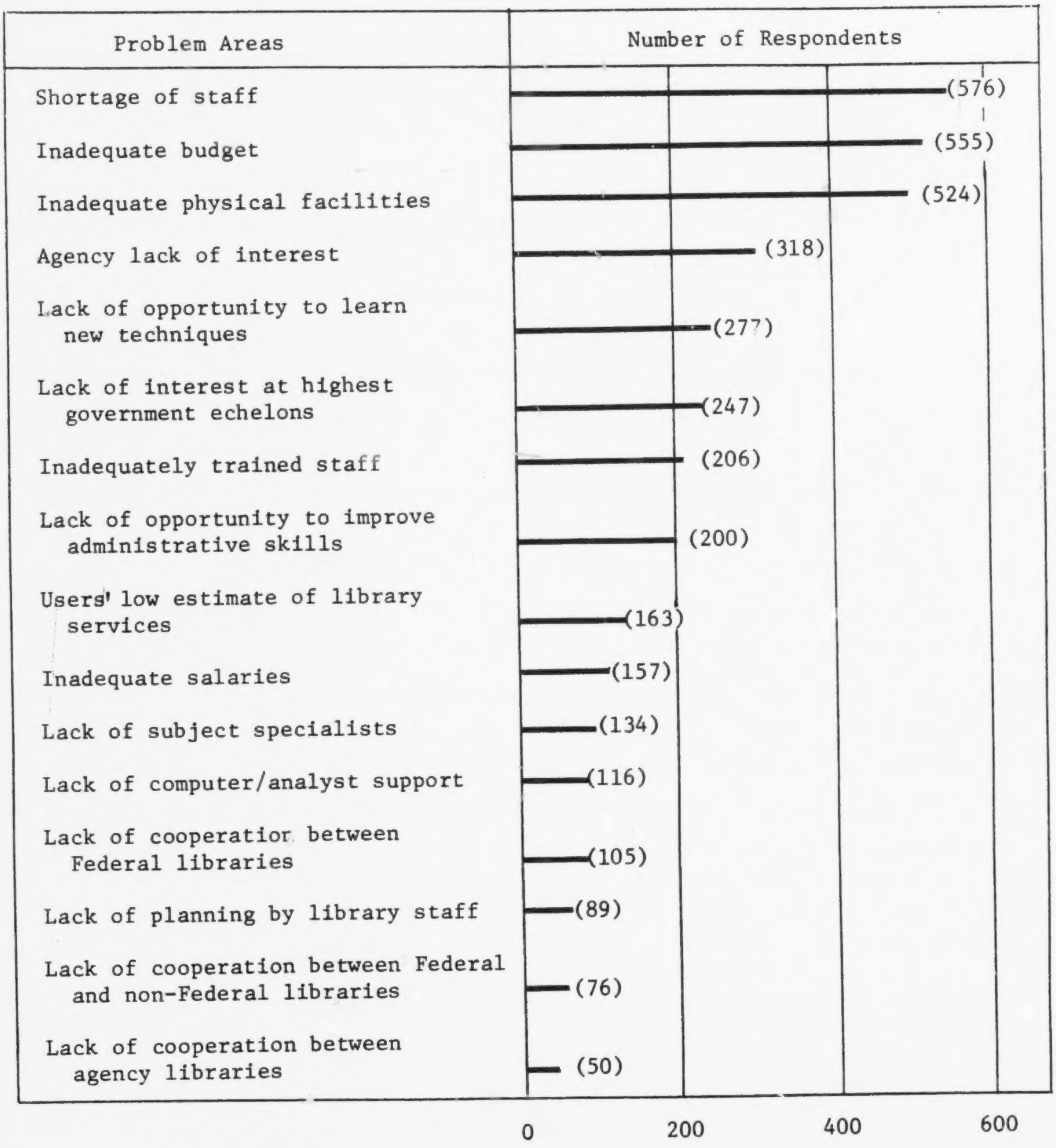

Figure IV-9. Problems Inhibiting the Improvement of Federal Library Services (Question 51)

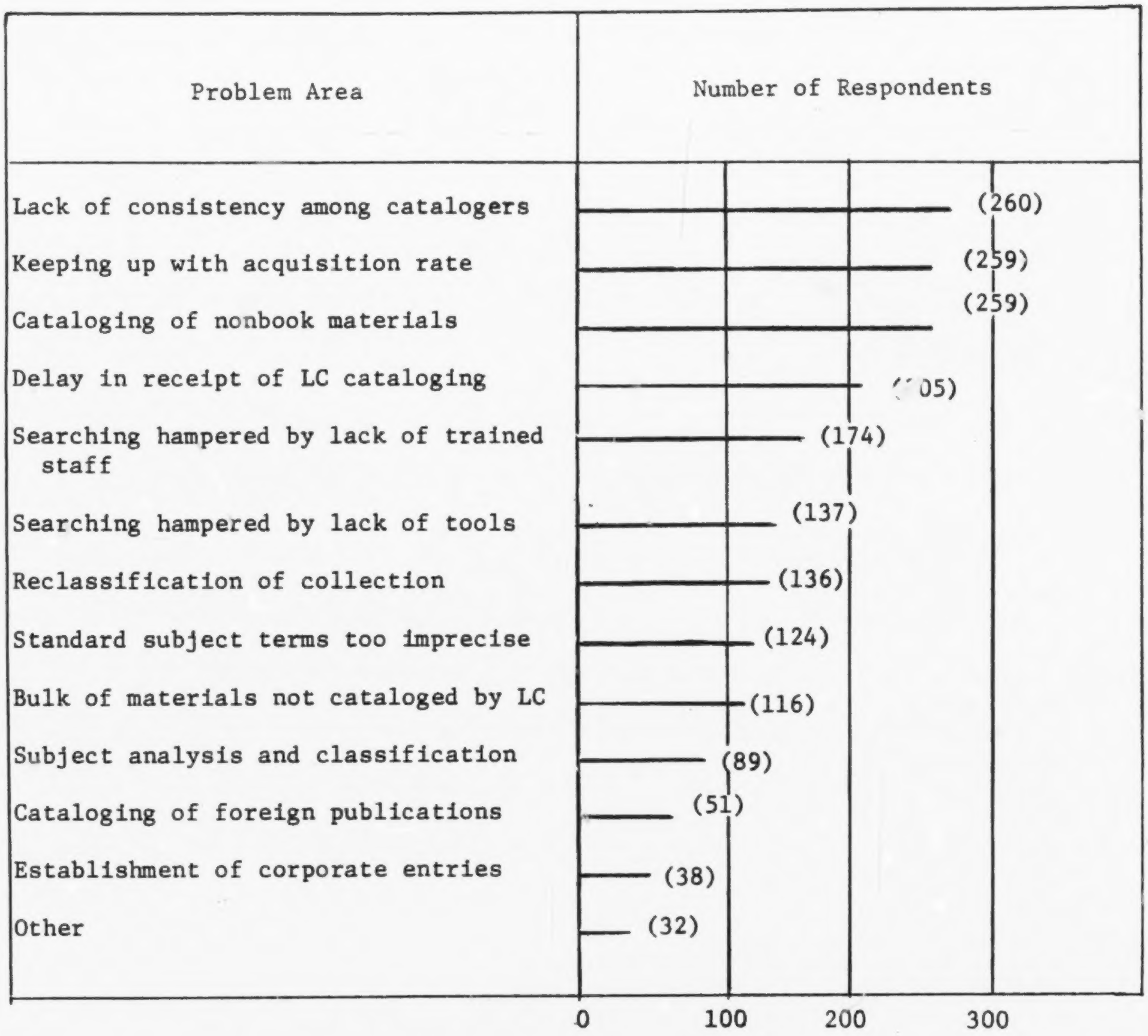

Figure IV-10. Problem Areas in Cataloging by Number of Respondents (Question 30)

CENTRALIZATION OF LIBRARY SERVICES

One way in which Federal library services might be improved, especially in the smaller libraries, is to increase the amount of processing effort accomplished in central libraries or processing centers. Furthermore, centralization of processing would provide an operational base of sufficient size to warrant computer support with an expectation of achieving some overall cost reduction. The existing degree of centralization of services is very low, and most libraries that provide such support do so for only a few other libraries.

Thirty-four Federal libraries reported that they provide some form of centralized cataloging service, as illustrated in Figure IV-11.

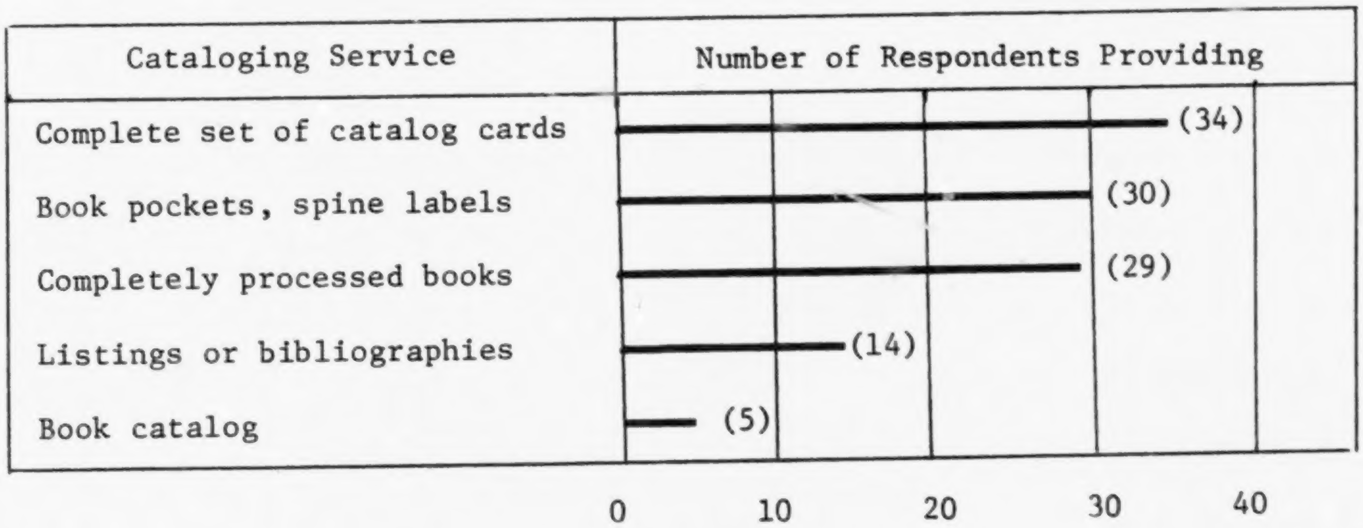

Figure IV-11. Cataloging Services Provided to Other Federal Libraries (Question 26)

This centralized cataloging is being performed almost exclusively for libraries within the central library's agency. Each kind of material is processed by at least three of the central libraries, as illustrated in Table IV-17. As Table IV-18 shows, the amount of material cataloged is not heavy compared to non-Federal processing centers and the number of libraries served is, in general, small.

TABLE IV-17. MEDIAN VALUES FOR MATERIALS CATALOGED BY CENTRAL LIBRARIES ANNUALLY (Question 25)

Material	Central Libraries	Median Titles[1]	Median Volumes[1]	Median Libraries Supported
Books	21	2000	5000	4
Serials	13	400	350	2.5
Government documents	9	400	-	100
Phonorecords	9	100	100	4
Technical reports	8	150	2000	3
Films	4	21	24	1
Pictures	4	40	-	1
Maps	3	30	-	3

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[1] These figures are suspect, since several instances were noted in which the number of volumes was less than the number of titles.

TABLE IV-18. TYPES OF MATERIALS CATALOGED BY RESPONDENTS PROVIDING CENTRAL SERVICES (Question 25)

Type of Material	Ranges of Titles	Range of Volumes	Range of Federal Libraries Served
Books	150 - 10,000	175 - 33,000	1 - 100
Serials	10 - 4,000	20 - 30,000	1 - 14
Government documents	120 - 1,600	150 - 1,500	1 - 20
Phonorecords	10 - 500	13 - 6,660	1 - 14
Technical reports	25 - 20,000	25 - 40,000	1 - 5
Films	3 - 200	18 - 100	1 - 1
Pictures	20 - 50	20 - 62	1 - 5
Maps	10 - 50	(no info.)	1 - 5

Forty-eight libraries provide acquisitions services for books and similar materials, and 54 libraries procure serials for other libraries, as illustrated in Figure IV-12 and Table IV-19.

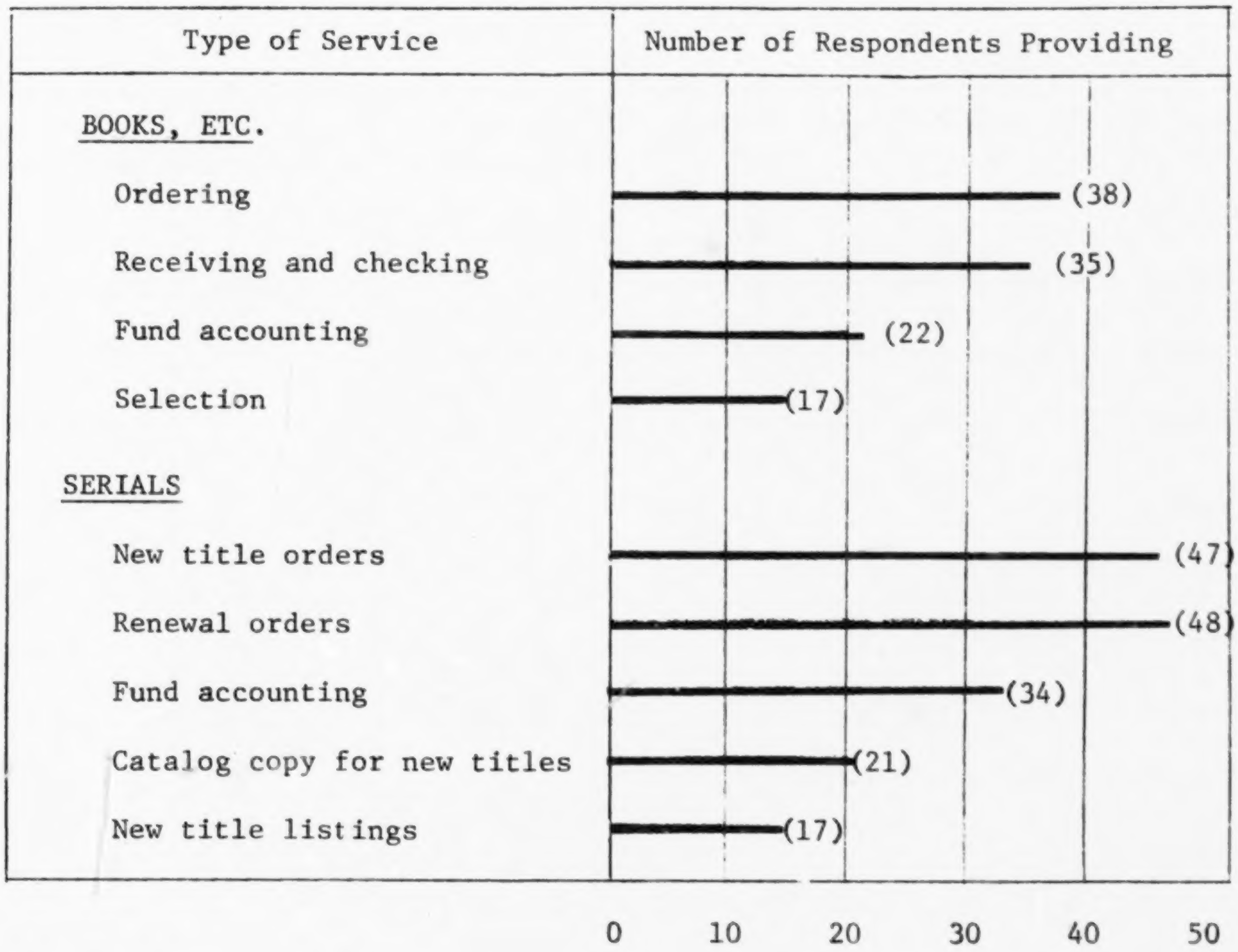

Figure IV-12. Number of Respondents Providing Acquisition Service to Other Federal Libraries (Questions 33 and 39)

TABLE IV-19. ACQUISITION SERVICE CHARACTERISTICS BY TYPE OF MATERIAL (Questions 33 and 39)

Acquisition Service Characteristics	N	Median	Range
BOOKS, ETC.			
Titles ordered annually	25	5000	250 - 50,000
Agency libraries served	41	40	10 - 300
Nonagency libraries served	3	-	40 - 300
SERIALS			
New titles ordered annually	28	25	1 - 1,112
Number of renewals annually	37	325	4 - 5,000
Agency libraries served	44	3	1 - 33
Nonagency libraries served	3	-	1 - 140

CHAPTER V. THE FUTURE OF FEDERAL LIBRARY AUTOMATION

INTRODUCTION

A number of studies have been made concerning Federal libraries, Federal library automation programs, and the relationship of the Federal library community to the extra-library information systems supported by the Federal Government. In general, these studies have been more subjective than empirical, and have concentrated largely on scientific and technical information services. Some of these reports have been prepared by authors biased against the Federal library community and cannot be said to be constructive in their approach.

In this chapter, empirical data from the Federal Library survey will be used as the basis for exploring the directions that Federal Library automation should take in the future. In considering these directions, the SDC team has taken the view that all Federal information systems, whether they are library-centered or not, are part of a continuum of services that can and should be improved. We believe that the strength and utility of the extra-library information services will be improved as the Federal libraries are themselves improved. We also believe that current jurisdictional impediments to an effective total Federal information program can and should be overcome.

This chapter is organized in three sections. The first discusses the factors influencing Federal library automation; the second outlines the priorities of needs in the Federal library community; and the final section explores alternative approaches to future Federal library automation support. References to supporting questionnaire data reported in the appendix are cited by question number.

FACTORS INFLUENCING FEDERAL LIBRARY AUTOMATION

In this section a number of factors influencing the development of Federal library automation programs will be discussed. Supporting data will be supplied, as appropriate, from the general questionnaire sent to all Federal libraries, and from the automation questionnaire sent to those libraries identified as having at least one operational automated activity.

Library Resources

The automation of libraries presumes, in general, an activity or collection of sufficient size to warrant computer-based services, and the staff and equipment resources to develop and maintain such services. Federal library automation resources are discussed below.

Library Holdings. The Federal libraries that have developed some automated activity are, in general, those Federal libraries with large collections. Table V-1 indicates that the 1st quartile for automated libraries (37,700 volumes) is larger than the third quartile for all Federal libraries (30,000 volumes). The range information shows that some small libraries can apply automation; the smallest reported collection was 2,500 volumes for a library with an automated activity. In general, however, Federal library automation to date has been limited to the larger libraries.

The opinion has been advanced, from time to time, that those libraries with large microform holdings are more technologically oriented and, therefore, more likely to automate. The findings bear this out to some extent. Table V-1 shows that for both automated and nonautomated libraries, the first quartile and the median of microform holdings are almost identical. The third quartile shows a decided shift to larger holdings for automated libraries.

TABLE V-1. COMPARISON OF HOLDINGS FOR AUTOMATED AND NONAUTOMATED LIBRARIES

Holdings	Median	First Quartile	Third Quartile	Range
Size of total collections				
Automated libraries (N=56)	142,500	37,700	350,000	2,500- 750,000
Nonautomated libraries (N=877)	15,951	8,362	30,000	10-10,000,000
Percent of total holdings in microform				
Automated libraries (N=42)	5	1	25	0-80
Nonautomated libraries (N=187)	2	1	10	1-97

The largest percentage of microform holdings in automated libraries (80%) was well under the largest reported for nonautomated libraries (97%); but the presence of any amount of microform is more common in automated libraries (42 out of 59 automated libraries have microform holdings).

Library Budgets. Table V-2 illustrates the financial resources of automated libraries as compared with those of nonautomated libraries. In budgets for book materials, the automated libraries at the median and third quartile spend about 8 and 10 times more than nonautomated libraries in the same quartiles. For staff, the automated library at the median level has a budget 7 times that of the nonautomated library. A similar comparison is shown in the equipment and supplies budget, where the automated library budgets at the third quartile are 9.3 times that of the library without automation. The greatest difference in budgets occurs for contractual services. The automated libraries at the median and third quartile levels have budgets that are about 14 times larger than comparable budgets in nonautomated libraries.

TABLE V-2. BUDGET COMPARISONS FOR AUTOMATED AND NONAUTOMATED LIBRARIES BY BUDGET CATEGORY

Budget Categories	Budget Totals			
	Median	First Quartile	Third Quartile	Range
Book and non-book materials				
Automated libraries (N=47)	42,500	7,875	110,700	550- 289,000
Nonautomated libraries (N=776)	5,800	2,511	11,000	25- 375,000
Personnel, full and part-time				
Automated libraries (N=47)	138,250	54,780	256,750	7,000-1,600,000
Nonautomated libraries (N=720)	19,000	10,400	30,000	1-1,508,000
Equipment and supplies				
Automated libraries (N=33)	5,600	925	17,875	50- 89,740
Nonautomated libraries (N=657)	600	273	1,915	5- 100,000
Contractual services				
Automated libraries (N=29)	14,500	3,700	34,000	160- 220,000
Nonautomated libraries (N=249)	1,027	458	2,523	10-2,000,000

AVERAGE TOTAL BUDGET, AUTOMATED LIBRARIES (N=56[1]) $335,580

AVERAGE TOTAL BUDGET, NONAUTOMATED LIBRARIES (N=769) . . . . $ 80,156

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[1] There were 56 respondents with operational or near-operational systems, but not all respondents answered all budget categories listed above.

Although the ranges make it clear that some nonautomated libraries have budgets that compare favorably with those of libraries that have automated, the financial support for local automation is lacking in more than three-fourths of the nonautomated libraries; the median for nonautomated libraries for staff expenditures ($30,000) is significantly below the first quartile for automated libraries ($54,780). In addition, the third quartile for contractual services for nonautomated libraries ($2,523) is below the $3,700 reported for automated libraries. Since staff is more important in implementing automation than are other resources (e.g., book holdings), these data are the most important discriminants in assessing the community potential for automation through local efforts.

Library Staff. Automated libraries, on the average, have about 6 times as many professional workers and 3 times as many clerical workers as non-automated libraries. However, the data indicate that large staffs are not essential to automated programs: half of the libraries with such programs reported fewer than 6 professionals and 6 clericals. Three-fourths of all the automated libraries had 28 or fewer staff members, and, as the ranges indicate, some nonautomated libraries have larger staffs than the automated libraries. It is necessary, in addition, to keep in mind that these are budgeted positions. Data from the survey reveal that the actual number of positions filled is often less than the positions budgeted.

TABLE V-3. COMPARISON OF BUDGETED STAFF FOR AUTOMATED AND NONAUTOMATED LIBRARIES

Budget Categories	Budgeted Staff			
	Median	First Quartile	Third Quartile	Range
Budgeted professional positions				
Automated libraries (N=57)	6.0	2.0	12.6	1.0- 5
Nonautomated libraries (N=693)	1.0	1.0	2.0	0.5-200
All other staff				
Automated libraries (N=55)	6.0	3.0	15.0	0 - 92
Nonautomated libraries (N=607)	2.0	1.0	3.0	0.5-500

Automation Equipment, Programs, and Personnel. Almost all Federal libraries responding to the automation survey reported systems based on equipment available in the local agency. Therefore, unless conditions change, it must be assumed that the type and availability of local agency equipment are important factors in the future of Federal library automation. Although the question was not asked directly, it seems, from comments submitted by many respondents, that library needs are not an important factor in local equipment selection. In many cases, librarians were not allowed to obtain equipment specifically for library staff use. This suggests that some library automation equipment specifications should be developed and made available to local agencies for consideration during equipment selection.

A wide range of data processing equipment is used in Federal libraries. The 56 automated libraries reported use of 41 different computer models, representing 10 different manufacturers. Eight systems were based on EAM equipment; three systems were based on microfilm retrieval equipment; and one used optical coincidence equipment, with associated punched-card retrieval. Three computer-output-to-microfilm systems are in use. A number of systems are on-line, either operationally or experimentally, and a wide range of terminal devices, including CRT displays, are in use.

Since the equipment was, by and large, not selected primarily for library use, the library makes do with what is available. Respondents reported difficulties caused by equipment changes; some systems have had to be reprogrammed for three different computers during their relatively short lifetime.

Computer program languages did not exhibit as much variety as was found for equipment. COBOL has been used most often, with FORTRAN as the second most frequently used language. The use of FORTRAN, which was not designed for language processing applications, indicates either that local programmers used it because they happened to be familiar with it, or that compilers in more suitable languages were not available locally. More recent projects report the use of PL/1, which many library automation experts recommend as the most suitable programming language available to date.

Relatively few computer programs using assembly languages for library operations are being developed in the library community. In comparison with the higher-order languages, they require a great deal more time to write, test, and perfect. They are also highly dependent on a particular machine. But even with the use of fairly machine-independent programming languages, such as PL/1 or COBOL, the variety of equipment may thwart the use of generalized library programs.

A major problem in exchanging information on existing programs is the sparseness of program and system documentation. Many responding libraries reported no documentation, and many indicated that the available documentation is primarily analysis- or design-oriented. Documentation of operational systems is not widely reported. There was no way to determine, within the constraints of this project, whether the existing documentation is merely "token" documentation or current, substantive information. Some respondents did send system documentation and it was, in general, quite good. However, the lack of standard terminology, both for data processing and for documentation format, makes it difficult to compare the systems themselves.

Those libraries that do not presently have an automation program were asked several questions exploring their local potential for access to automation equipment and personnel. Their responses (fully tabulated in Question 16 of the Appendix) showed that:

- 438 respondents have no local agency computer
- 285 respondents have a local agency computer--of these, 76 have been informed that the local agency computer could be made available to the library, and 53 have been assured that systems analysis and programmers could be made available
- 35 respondents have applied for automation planning funds and have been unsuccessful.

These data reveal that perhaps a thousand Federal libraries do not have computers available to them in their local agencies (assuming that those who did not answer this questionnaire have similar characteristics to those who did). Extension of automation to this community will require centralized services of some type.

The data also reveal that 285 libraries have at least a potential for local automation if we assume that all of the reported computers are suitable for some library operations. Of these, 76 are definitely available. Even the use of these would double the number of automated Federal libraries, and the use of all 285 computers (in addition to the 59 libraries already automated) would extend automation to more than 10 percent of the community.

The availability of systems analysts and programmers was reported by 70 percent of the respondents with operational programs as a major factor in their decision to automate. Out of 56 libraries, only 16 had systems analysts on the library staff and only 14 had programmers on the staff. Therefore, the willingness of local agencies to allocate the time of analysts and programmers to library automation projects is currently vital to implementation of local programs.

Out of 56 libraries, 12 reported that they were able to obtain more staff for library automation development and operation, but that it was difficult; 10 reported that they were not permitted to get more staff; and 15 did not even request additional staff, operating with the same staff that they currently had. In short, almost 50 percent of the respondents (25 of 56) were able to implement some automation program without additional staff, whether they thought such staff was necessary or not. Since automation planning and development are activities in which the library staff played a major role, according to 85 percent of the respondents, it must be assumed that, in some cases, other library activities suffered during the development of the automated system. The need for locally available staff support to aid in automation activities is critical, particularly in view of the shortage of available manpower with experience in library automation.

Agency Management and Administration

Several questions in the survey explored the relationship between management attitudes and automation progress. Although lack of management interest ranked fourth as an impediment to improvement in library services in general, it ranked only sixth as an impediment to automation. Yet, three times as many respondents cited lack of management interest, as compared to lack of library interest, as significantly delaying local library automation.

Libraries with operational projects were asked what role such interest and support actually play in implementing an automation program. Sixty-one percent indicated that the interest and support of the library director's immediate supervisor was a major factor in the decision to automate and 36 percent judged it to be a minor factor in the decision to automate; only 3 percent considered it of no importance. On the basis of these findings, it seems clear that the attitudes of the administrators to whom library directors report are of considerable importance and that efforts should be made to educate and interest this group in the potential that automation may have for the particular library. A small proportion of the stimulus comes from the other direction. Fourteen respondents with operational programs reported a specific management request for automation. Librarians were asked to predict how their local agency administration would react to two different situations: (1) local automation planning, and (2) cooperative automation planning with another agency or non-agency library. The predictions are shown in Table V-4.

TABLE V-4. PREDICTIONS OF LOCAL AGENCY ATTITUDES TOWARD LOCAL AND COOPERATIVE LIBRARY AUTOMATION PLANNING

Local Agency Administrative Attitude	Percent Predicted to Hold Attitude Toward Local Automation Planning	Percent Predicted to Hold Attitude Toward Cooperative Automation Planning
Would provide support and encouragement	23	32
Would react favorably, but would want responsibility for planning or control	7	7
Would not provide support, but would not object	15	18
Would react unfavorably	19	7
Don't know	37	43

There are several important points reflected in these data. First, a sizable number of Federal library directors do not seem to be in sufficiently close communication with local administrators to understand or predict their positions about library automation. Second, the data suggest that the administrators would not strongly encourage library automation. Third, the libraries believe that the administrators would tend to react more favorably toward cooperative than local projects.

Other management and administrative problems cited by the automation survey respondents were as follows:

- The library was not allowed to obtain its own input equipment.
- Year-to-year funding hampered project planning and management.
- Budget cuts were made in library automation.
- Library management was not given a choice in contractor selection.
- The library was assigned a low priority for computer time.

It may not be possible to solve all of these problems, but their existence must be taken carefully into account in planning any generalized program packages.

Status of Federal Library Standards

The picture with respect to use of standards is not rosy. According to the respondents to the automation survey, most agencies leave the use of standards up to the local librarian. Thirty-six out of 51 respondents reporting on operational systems said that they were not required to use agency standards, let alone national standards. In a few cases, the local librarian did not know what the agency's policy was. The few respondents who reported that use of agency standards was required cited the following examples:

USAF standards (Manual 161-100, 171-110)
NASA Thesaurus
ERATOM Thesaurus
Agency accounting codes
Agency security classification codes
Local general-purpose data forms, modified to library input

Only 3 out of 26 operational cataloging systems used Project MARC or MARC II formats. In all three cases these were modified. Only one planned system reported an intention to use the MARC format. One respondent with an operational automated catalog project did not know what the MARC format was.

The evidence is quite clear that much effort is expended locally in establishing and maintaining local formats, codes, etc. While not all of these are amenable to standardization within the Federal library community, a number of them are. Some examples of the local efforts include:

- Development and maintenance of subject heading lists and thesauri
- Development of publisher codes, geographic area codes, and frequency codes
- Development of codes for types of materials, bibliographic formats, etc.

Many of these codes have been developed as part of the MARC format work and have been published. Apparently, not all librarians understand that they can be applied to all areas of library automation and not just to MARC-related purposes.

Utilization of Non-Local Data Bases

No Federal library automation project reported use of a data base that was developed specifically for an automation activity in another library. For example, there was no use of someone else's serials file or catalog file. However, there was use, in both automated and non-automated libraries, of machine-readable data bases designed for nation-wide use. A suprisingly large number of respondents (256, or almost 27 percent of the total) reported such use, and 157 of them search the data bases in response to individual inquiries.

The data bases used are listed in order of descending frequency of use. The number of respondent libraries using each is in parentheses.

MEDLARS	(139)
DDC Technical Abstract Bulletin (TAB)	(122)
NASA/RECON data bases, e.g., STAR	(53)
ISI data bases	(52)
Chemical Abstracts (various)	(33)
Engineering Index	(30)
MARC II	(22)
Biological Abstracts	(28)
ERIC	(16)
Abridged Index Medicus (AIM-TWX)	(12)
Other data bases, e.g., Nuclear Science Abstracts, DATRIX, and USGRDR	(26)

During the processing of the questionnaires, we attempted to eliminate responses indicating that our question on data base use was interpreted as use of the hardcopy equivalent to the data bases. However, some of the figures above may still be inflated. In the automation questionnaire, only two respondents indicated that they were using MARC data. It is not clear, therefore, how 22 users have access to the MARC data bases, unless they are subscribers to some of the services that process MARC on a fee basis, and there are not many of these.

In accessing these data bases, 68 percent of the 256 libraries forward a written, formatted search request to the agency maintaining the data base; the other 32 percent send a written, unformatted request. About 18 percent forward the request over the telephone or Teletype. Only 4 percent of the respondents (16 in all) have direct on-line access to the data base and perform the searches themselves. Of these, 6 use an on-line hardcopy terminal and 10 use an on-line CRT-display terminal. Since NLM's AIM-TWX service uses hardcopy terminals, and 12 libraries reportedly use this service, it appears that some of the libraries may use some data base services through other libraries that have the necessary equipment.

Of the 256 respondents who use outside data bases, 219 provided information on the frequency of such use:

- 191 libraries access outside data bases for fewer than 25 searches per month
- 14 libraries make between 26 and 50 searches per month
- 14 libraries make more than 50 searches per month

We estimate that about 3000 such searches are made monthly. This estimate was derived by assuming 10 searches per month for 191 libraries, 26 searches (the lower bound) for 14 libraries, and 50 searches (lower bound) for 14 additional libraries. This provides a conservative estimate of the annual Federal library use of such outside data bases as at least 36,000 searches.

There was a contradiction in the data on the number of libraries maintaining SDI profiles. The answers to one question indicated that 33 libraries maintain such profiles; another question elicited a total of 56 positive responses. The conflict might have arisen because the first question was phrased, "We maintain user interest profiles," and was joined to a series of questions related to outside data bases. The succeeding question, which also related to outside data bases (according to instructions supplied), explored the number of such profiles and the activity rate. It used the term "SDI profile" rather than "user interest profile"; it may be that respondents either did not equate SDI profile with user interest profile, or they answered the second question to include both local and outside data bases. At any rate, 48 respondents maintained fewer than 25 profiles, 8 maintained from 26 to 50 profiles, and 10 maintained more than 50. One must wonder how efficient it can be for individual libraries to use and maintain SDI programs for such relatively small groups of users.

The use of these outside data bases, for retrieval or for dissemination, indicates that Federal libraries are willing to provide an extended service to their users by tapping outside resources; it is particularly promising that two-thirds of the Federal libraries that use outside data bases find out enough about them to be able to format their search requests. Since this type of service is fairly new, these data suggest an acceptance of machine-readable data bases on the part of Federal libraries, and the potential of both mail and on-line access as a feasible augmentation of local library capabilities.

Communication of Automation Experience

Slightly more than 38 percent of the libraries that had automated indicated that knowledge of a similar automation program that had been successfully implemented elsewhere was a major factor in their own decision; an additional 36 percent considered such knowledge a minor factor. Thus, the knowledge of outside programs affected at least 74 percent of existing automation programs. Only 26 percent of respondents considered it of no importance.

Interestingly enough, only 9 out of 55 respondents had published project reports for other Federal librarians or for outside librarians. Only five projects had been reported to the library community at large, and only 9 to the Federal library community, through oral presentations at conferences or meetings. Apparently, the Federal library community has had to depend largely on reports about automation in university, college, and public libraries for its knowledge about library automation. Since it is not always easy to generalize when reading about a particular application--e.g., from a university library circulation system to a Federal library circulation system--it seems certain that the course of Federal library automation could be improved if more Federal librarians were exposed to reports on systems with which they can identify, rather than those whose similarity to their own operations is less obvious.

Automation Attitudes

The survey data reveal an amazing receptiveness toward automation in the Federal library community. There are few negative attitudes. Only 20 percent of the respondents did not see how automation could improve their local service. Only a handful of respondents (43 out of more than 700) thought that library operations were too complex to allow automation. This is a rather important response, since it shows that the overwhelming majority of respondents believe that library operations can be automated. One would not expect such a small negative attitude in a community that is not itself widely automated. About 15 percent of the respondents indicated that the cost-effectiveness of library automation has not yet been proven. This should probably be termed a realistic rather than a negative response.

Those librarians who had other staff members were asked to judge how well they felt their staff would accept automation. About 55 percent judged that the response would be enthusiastic or willing. Twenty-two percent judged it would be neutral. About 15 percent thought it would be negative or hostile, and about 13 percent didn't know their staff members' attitudes toward automation. No direct attitude assessment was asked for the one-staff-member libraries. However, since the single staff members completed the questionnaire, it is assumed that their answers are reflected in the attitude questions discussed elsewhere. It is interesting that the librarians do not fall back on the device of saying that their staffs are against automation.

In spite of their positive attitude toward automation, most of the respondents were not sanguine about the likelihood of automation in their libraries. More than 70 percent of the respondents believed that because of its small size, their library would not share the benefits of automation. More than 30 percent thought that lack of trained staff would significantly delay automation, and more than half felt that local funding was inadequate to support automation planning or development. In view of the heavy burden borne by librarians in planning and implementing local automation efforts, as reported by those librarians with operational programs, it seems clear that lack of trained staff and lack of funds are the major impediments to library automation.

PRIORITIES OF NEEDS IN FEDERAL LIBRARY AUTOMATION

Introduction

The previous section identified some of the local factors that are critical to automation, including supporting staff, equipment, management attitudes, etc.. This section explores the functional factors relating to automation, e.g., operations being performed, methods of performing them, and constraints under which they are performed. It focuses on the priority of needs in Federal library automation, based on responses to the general survey and the automation survey, and includes a target list of functions that are amenable to automation and that have potential value to the community. The next section evaluates the methods by which automation can be supported.

Problem Areas in Current Library Operations

The goals of Federal library operation should include the improvement of existing services, as well as the introduction of new services. However, individual Federal libraries do not see lack of automation as a major factor that limits their ability to improve existing services. Most of them are too poverty-stricken to accord the computer a prominent place in their thinking about how to meet their pressing needs. In fact, in a listing of factors considered critical in improving existing services (question 51), lack of computer and/or systems analyst support ranked only twelfth.

The 11 factors judged more important were:

1. Shortage of staff
2. Inadequate budget
3. Lack of adequate physical facilities
4. Lack of interest in library problems at agency level
5. Lack of opportunity for Federal libraries to keep up with new techniques

6. Lack of interest in libraries in highest government echelons
7. Inadequately trained staff
8. Lack of opportunity for library staff to improve administrative techniques
9. Low value placed on library services by users
10. Inadequate salaries for librarians
11. Lack of subject specialists on library staff

Six of these 11 factors are staff-related, clearly indicating that the most compelling current problem is staffing. Automation can provide support to local staff, but only if it can be accomplished without increasing the local staff workload, e.g., through centralized development and/or management of automation support or through the addition of staff members for automation work. It is clear that, at least for the present, automation cannot be promoted as a means for reducing present staff levels: staffing is already so inadequate that most libraries are barely able to maintain existing library services, and have no capacity for extending them.

The inadequacy of many present Federal library budgets and the critical importance attributed to budget by the survey respondents indicate that automation cannot be significantly increased at present funding levels. Automation cannot be sold to most Federal librarians if it must come out of their current and already inadequate budgets. Clearly, automation support must be obtained outside of current funding, and must not be obtained at the expense of improved support of existing services.

The lack of adequate physical facilities is a recurring theme in the survey results. Not only did it rank third in this listing (question 51), but it was cited as second and third in another (two-part) question that explored improvement of present services (question 54). Although automation might eventually alleviate some space needs, if certain services were performed centrally, the current scarcity of space is viewed as so critical that automation does not appear to afford a solution.

Two other factors (ranked fourth and ninth) relate respectively to lack of interest in the library at the agency level and lack of user interest at the local level. The lack of user interest may well stem from the inadequacies of the library itself. In this area, automation could assist the local librarian by providing services that meet user needs more effectively. In addition, if automation planning were accomplished at a higher level than the local library, it could be an effective vehicle for educating agency management about the needs of the library and the importance of its services. Many instances of increased interest in the library as a result of automation programs have been cited in the literature. High-level attention to automation might well lead to increased overall support for Federal libraries, because it would involve agency management, perhaps for the first time, in systematically exploring and documenting information and communications problems.

Target Functions for Automation

Librarians were asked a number of questions that probed the present operational aspects of--and problems associated with--the functions that they currently perform. They were also asked about services they would like to provide, and about services they thought would be desirable from an automated system.

When asked about present services that need improvement (question 54), only four out of the six top responses were actually service-related (the second and third in order of priority were additional space and staff). The order of priority of the four actual services was:

1. Reference
2. Acquisitions
3. Cataloging
4. Preparation of bibliographies

Respondents were asked to rank those operations they would most like to see improved, from an administrator's point of view (question 53). These responses are shown in Table V-5.

TABLE V-5. LIBRARY OPERATIONS OR SERVICES GIVEN FIRST OR SECOND PRIORITY FOR IMPROVEMENT BY SURVEY RESPONDENTS

Library Operations or Services	Number of Respondents	Rating	
		First Priority	Second Priority
1. Reference Collections	298	143	155
2. Ordering Materials	248	180	68
3. Reference Services	217	143	74
4. Cataloging	191	127	64
5. Clerical Operations	186	119	67
6. Budgeting and Accounting	140	86	54
7. Circulation Control	139	88	51
8. Location of Needed Materials for Users	138	93	45

The totals for other areas were: Staff Training (121), Staff Recruiting (196), Planning and Administration (103), Identification and Selection of Materials (93), Serials Control (excluding documents and technical reports) (89), Control of Documents and Technical Reports (63), Control of Audio-Visual Materials (60), Systems Analysis Planning (60), Abstracting and Indexing (58).

Question 51 probed problem areas by asking librarians to rate local performance in four groupings: "good to excellent," "fair," "minimal level," and "serious difficulties." Table V-6 sums these responses, assuming that all operations rated from "fair" to "serious difficulties" are prime areas for attention.

TABLE V- 6. RESPONDENTS' RATINGS OF THE ADEQUACY OF CURRENT LIBRARY OPERATIONS

Operation	Total "Fair," "Minimal Level," and "Serious Difficulties" Ratings
1. Claiming of Missing Items of All Types	470
2. Acquisition of Materials	413
3. Descriptive Cataloging	344
4. Provision of Reference Services	322
5. Control of Serial Materials (exclusive of documents and technical reports)	317
6. Circulation Control	310
7. Maintenance of Catalog Cards and Other Files	305
8. Subject Analysis and Classification	286
9. Fund Accounting and Control	266
10. Identification and Selection of Materials Wanted for Collection	255

Other operations and their totals were: Control of Technical Reports and Documents (223), Information Retrieval from Collection (216), Control of Audio-visual Materials (13), and Abstracting and Indexing (151).

Although the responses summed in the above Tables are related to several different questions covering a variety of library problems, an analysis of the responses reveals a rather striking consistency. Reference service, order and acquisitions functions, and cataloging are among the top four in all lists. In addition, since the above lists include associated operations, many of the areas that need improvement are associated with these major functions; e.g., items 1, 7, and 8 above are catalog-related tasks, while 1, 2, 9, and 10 are acquisition-related.

On the basis of all the available data, we conclude that the prime candidates for automation assistance should be:

1. Reference support systems
2. Acquisitions support systems
3. Cataloging support systems

The areas of secondary importance for automation assistance are:

4. Circulation support systems
5. Serial support systems

Although these functional areas can be identified as targets for automation, some additional information on present methods of performing various services in the Federal library community as a whole will be required before centralized services or standard program packages can be initiated. However, it is possible to identify the priority needs within each area of library function. These are discussed in the following section.

Priority Needs within Major Library Functions

Reference Functions. Those aspects of reference service that are amenable to automation were itemized in the questionnaire. Table V-7 shows the major reference services now provided by Federal libraries. Two figures are given for items 6 and 8 because these services are reported differently in different questions (see questions 15 and 44).

TABLE V-7. REFERENCE SERVICES PROVIDED BY RESPONDENTS

Reference Service	Percentage of Survey Respondents Providing Service
1. Preparation of Subject Bibliographies	66
2. Provision of Current Awareness Service of New Publications of Interest to Users	58
3. Control of Uncataloged Reference Materials	56
4. Direct or Indirect Use of Outside Machine-readable Data for Reference Searches	26.6
5. Maintenance of Files of Outside Resources for Referrals	25.5
6. Selective Dissemination of Information on a Routine Basis	25 -31
7. Preparation of Bibliographies for Certain Types of Materials	21
8. Indexing and Abstracting	14.3-26
9. Provision for Keyword Indexes	4.8

All of the reference functions listed in Table V-7 are clearly amenable to automation. Purely local functions, such as items 3 and 5, would probably not be considered areas of primary importance. On the other hand, the MARC tapes would provide a data input that could support all functions, with the exception of item 8. Access to other tape services that include abstracting and indexing information might eliminate much of the need for provision of this service at the local level.

On the basis of our analysis of survey findings, we believe that the major requirements for automated reference assistance are:

1. Coverage of subject fields of most interest to the Federal library community
2. Coverage of types of materials of most interest to the Federal library community
3. Provision of access by subject and by type of material, as well as by name, title, etc.
4. Methods for handling library or library user profiles
5. Provision of keyword indexing for selected types of materials
6. Flexibility in output products to meet local needs
7. Mechanisms to allow efficient handling of on-demand searches, either by mail or through on-line access
8. Provision of service on a current basis
9. Costing formulas to provide service to all Federal libraries desiring such service

Acquisitions Functions. Acquisitions is predominantly a local activity, although a number of centralized supporting services are used. Forty-six percent of the respondents receive all materials by virtue of local ordering, 41 percent use both local and central ordering, and only 13 percent receive all materials from a central agency ordering service. Selection of items for the collection is also a localized activity. Local selection was reported by 896 respondents, 738 of whom report that the librarian has final approval. Only 60 respondents reported that the selection of materials must be approved above the local agency level. The majority of respondents (852) report that the final approval for materials purchased is made locally and in 504 libraries this decision is made within the library itself. Only 125 respondents reported that purchases have to be approved above the local level.

Materials come to the library from vendors, from blanket order dealers, from exchange partners, on automation distribution, and as gifts. The most frequent acquisition mode is individual orders placed with vendors. Slightly more than half of the respondents (478) receive some publications automatically for their agency or department; less frequent modes (in order of descending importance) are automatic distribution from the Superintendent of Documents, exchange partners, central agency orders, and blanket order dealers.

The current major acquisitions activities are shown in order of frequency in Table V-8.

TABLE V-8. ACQUISITION ACTIVITIES REPORTED BY RESPONDENTS

Acquisition Activities	Number of Survey Respondents Reporting Activities
1. Scanning Listings of Materials in Area of Interest	587
2. Order Preparation and Transmission	511
3. Ordering Catalog Cards	502
4. Maintenance of Order Status Records	498
5. Maintenance of Want Lists	446
6. Claiming	415
7. Maintenance of Fund Accounts	368

Respondents (question 35) consider the following services desirable from an automated system (listed in order of desirability, based on first and second choice ratings).

1. Special bibliographies and listings in areas of interest
2. Order preparation and transmission to vendor or other source
3. Maintenance of order status records
4. Catalog card orders
5. Maintenance of want lists
6. Claiming
7. Fund accounting

Most respondents showed a positive attitude about the benefits and possibilities of acquisition automation (question 36).[1] The majority responses to statements related to attitude are shown in Table V-9.

TABLE V-9. ATTITUDES TOWARD AUTOMATION OF ACQUISTIONS FUNCTIONS

Statement	Percentage of Respondents	
	Agree	Disagree
1. Local staff would require significant retraining to use automated system.	80	
2. Automated system could provide many products that our present system cannot.	72	
3. Records for our library would be less useful if they were maintained by an automated system.		70
4. Local agency policy would prevent our participation in a centralized acquisitions system or network.		66
5. Time required to obtain a needed item would probably be increased in an automated acquisition system.		58
6. Centralized literature review and selection would be better than our present system.		51
7. An automated system would be difficult to develop because of red tape involved in acquisitions.	(about evenly divided)	

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[1] The section on reference services in the automation questionnaire did not include questions on attitude toward automation of reference. Such questions were asked only for acquisitions, cataloging, circulation, and serials.

We believe that automated acquisitions systems should, in general, provide for:

1. Selection lists in area of library's interest
2. Automated preparation of order forms
3. Fund accounting
4. Control of status of items on order
5. Claiming
6. Identification of wanted items
7. Automatic ordering of catalog cards

Most Federal libraries acquire materials at a very low rate. This is an important factor in determining what kind of centralized service is appropriate. Only 35 libraries reported total acquisitions in any category of materials of more than 10,000 titles per year. The overwhelming majority acquired fewer than 1000 titles in any category of materials. If a centralized acquisition service were to be provided for all or most libraries, the projected total acquisitions load for all materials would be about 14,000,000 items per year; for book and serial titles, the projected annual load for all libraries would be only about 3,200,000 items per year.

In thinking about a generalized software package, it will be necessary to consider how inclusive a system is needed, how complex the funds-control system should be, and how to deal with the various procurement regulations of the participating agencies.

Most automated acquisition systems incorporate orders to specific vendors only; some systems handle exchange orders, orders from blanket order dealers, and orders from free and gift materials; presumably, a generalized system package should provide for all of these. Fund management should not present the complex problem for Federal libraries that it usually does for university libraries: 31 percent of the respondents ordered all materials from only one fund. Dealing with agency procurement procedures is more of a problem. Almost 24 percent of the respondents reported having to purchase library materials through bidding procedures. The majority of respondents still use an agency procurement form for all purchases that is not tailored specifically for library materials; however, 326 respondents use a publication order form that is standardized within an agency, 97 have developed a local form, and 134 use forms from commercial library supply houses.

To support either centralized acquisitions service or a generalized software package, a number of standards need to be developed or adopted. These include:

1. Standard Federal library purchase request form
2. Standard Federal library ID code
3. Standard Federal library agency ID code
4. Standard fund account codes
5. Standard Federal library purchase order form
6. Standard Federal library vendor codes (for major vendors)

Cataloging Functions. Bibliographic control in Federal libraries is not greatly different from that in other kinds of libraries. Books are generally fully cataloged; other materials are generally given brief cataloging or are not cataloged at all. The use of LC data is reported by almost 50 percent of the respondents, and it may be much higher. The question about locally prepared cards (question 23) did not ask whether these were derived from local cataloging or were merely LC data retyped from prooflistings, National Union Catalog, etc. The dictionary card catalog is prevalent; book form catalogs are few, and are generally maintained as a by-product of an automated system.

The most frequently reported catalog products are shown in Table V-10.

TABLE V-10. NUMBER OF CATALOGING PRODUCTS USED BY RESPONDENTS

Cataloging Products	Number of Respondents Using
1. Full Set of Catalog Cards	836
2. Labels for Book Pockets and Spine	665
3. New Title Listings	569
4. Subject Area and Special Book Listings	409
5. Operational Statistics	219
6. Book Catalog or Index Lists	217
7. Name and Subject Authority Lists	185
8. SDI Notices by Interest Profile	125

Infrequently cited products were machine-readable data for local information retrieval, punched book cards for circulation, and computer-produced proof listings.

When asked about desirable products from an automated system (question 27), the respondents showed no strong consensus. Only 5 out of the 11 products posed were selected by more than 15 percent of the respondents. In order of preference these were:

1. Full set of catalog cards
2. Labels for book pockets and spines
3. Subject area listings or special bibliographies
4. Book catalog or index listings
5. Lists of new titles for distribution to users

Nevertheless, a strong feeling prevails among respondents that automation of cataloging has great potential. The majority responses to statements related to catalog automation (question 59) are shown in Table V-11.

TABLE V-11. ATTITUDES TOWARD AUTOMATION OF CATALOGING FUNCTIONS

Statement	Percentage of Respondents	
	Agree	Disagree
1. Our cataloging is too difficult or unique to allow us to use automated cataloging.		89
2. We would be able to change to an automated catalog if it had the flexibility to meet all our needs.	85	
3. Due to duplication of materials collected locally with other libraries' holdings, an automated catalog system using centrally prepared records distributed in machine-readable form would cut costs.	76	
4. An automated cataloging system could probably do a better job than we could do manually.	75	
5. We do our cataloging faster manually that a centralized system probably could.		59

The major current cataloging problems include lack of consistency in cataloging, difficulty in cataloging nonbook materials, difficulty in keeping up with rate of new acquisitions, delay in receipt of LC cataloging, and lack of trained staff for catalog data searches.

Automated cataloging systems should be capable of performing the following tasks:

1. Produce full sets of catalog cards.
2. Produce book labels and spine labels.
3. Produce special subject listings, new title listings, etc.
4. Produce book catalogs of index listings.
5. Incorporate LC cataloging.
6. Incorporate nonbook materials as standardized records become available.
7. Incorporate needed local modifications, e.g., for school collections, research collections, etc.
8. Provide search service to help local librarian identify needed catalog record.
9. Incorporate abstracting and indexing information with catalog record.

For generalized program packages or centralized services to be provided, it is clearly necessary to develop greater standardization. The LC catalog card and the MARC II format serve as national standards for book cataloging, and MARC standard formats are already adopted or in process for nonbook materials, including maps, projection materials, and films. The COSATI standard for technical report literature is reported to be compatible in structure with MARC, although it has different tags for comparable or identical data fields. The MARC and COSATI work provide a useful base from which to develop additional standards, for example on:

1. Catalog card formats
2. Book catalog formats
3. Bibliography and listing formats
4. File maintenance procedures

All of these would be required for the fruitful use of generalized program packages, and the first three would be desirable for the use of centralized service.

Serials Control Function. Only about 20 percent of the respondents (239) retain serials and periodicals on a permanent basis. Most Federal libraries do not. There is a heavy recurring workload for subscription renewal, since only 81 out of 809 respondents who order serials are able to place orders on an "until cancelled" basis. Serials ordering is the most centralized aspect of Federal library operations; about 50 percent of the respondents report that their subscription orders are handled by the central agency library or an agency purchasing office. Since automation of serials requires a heavy investment of local effort for getting the system under way, e.g., conversion of subscription renewals lists, conversion of serial record file, etc., it does not seem to be an area for first-priority attention in planning automation support.

The particular serials controls service identified by respondents as the most desirable was serials subscription order and renewal. It was picked as a first or second choice (question 40) by 492 respondents. If centrally-supported serials automation were being considered, this function would represent a good place to start.

Since many libraries have found serial titles listings--with or without holdings statements--beneficial, it might also be useful to provide some kind of standard format and program for this particular serial function. Since this listing does not constitute part of the core bibliographic operation, it should be relatively simple to develop a program package in this area. The local library could then elect to input some or all of its titles--and none, all, or truncated versions of, its holdings data. However, this service was not given a high desirability ranking (question 40).

Circulation Function

Circulation was not given a high priority for automation by the survey respondents, no doubt because circulation volumes are relatively low. Of the 835 respondents who provided statistics for circulation of books and bound periodicals, almost 73 percent have a total weekly circulation of 500 or fewer titles. In addition, since circulation depends so largely on local agency practices and work habits, it does not readily lend itself to standardization, even though most circulation systems operate in the same basic fashion. Many Federal libraries already use "semiautomated" circulation equipment that provides adequate control and access. These devices are probably sufficient for all but the largest library systems.

ALTERNATIVE APPROACHES TO FEDERAL LIBRARY AUTOMATION SUPPORT

Introduction

To date, most planning for long-range library automation has been based primarily on speculation rather than on fact. To some degree, this charge could also be leveled at this study, since it cannot provide a precise measure of the benefits to be gained from an expansion of Federal library automation. Furthermore, specific costs are not available for weighing various alternatives, or even for the recommended approach.

However, the survey data do provide a very strong basis for formulating and weighing alternatives, because they reflect guidance from the Federal library field itself rather than what some group of experts think the users want. Thus the present study represents a somewhat unique and, we hope, refreshing point of view. It is clear (questions 17 and 20) that the Federal library community has expressed a decided preference for:

- Centralized automation planning
- A stronger role of the Federal Library Committee in supporting local Federal library automation planning
- Centralized automated Federal library networks or service centers
- Standardized program packages for use in Federal libraries.

Representatives of Federal libraries clearly prefer to participate in Federal rather than non-Federal networks. They also show a clear preference for having local library automation supported by the Federal Library Committee, rather than by national and other key libraries.

This strong mandate for centralized planning in support of Federal library automation, and the clear desire for some type of network or service approach, is coupled with an equally strong feeling that for each library to develop its own automated system is undesirable. The alternatives below are proposed and evaluated in the light of this clearly-expressed desire on the part of Federal libraries for a central planning effort.

In the previous sections we discussed factors influencing automation, basing the discussion on information from the survey data. This section deals with various alternatives for development, promotion, and utilization of automation throughout the Federal libraries. Before considering the alternatives, it is appropriate to review some of the factors that will be useful in evaluating them.

In the Handbook on Federal Library Automation (the companion volume to this report), several guidelines were proposed for effective automation planning and development at the local level. It seems reasonable to assume that if a systems approach is essential in automating one library, it will be even more necessary to follow a systems approach in planning for the entire community. The section that follows will extend the basic considerations for automation planning that are presented in the Handbook to encompass (to the extent possible at this time) all Federal libraries.

Basic Considerations

Need. Neither this survey nor other similar studies have been able to arrive at a precise measure of automation need. It is clear that the Federal library community has many needs: more funds, larger staff, better facilities, improved bibliographical control and access, etc. It is equally clear that automation alone cannot meet all of these needs. Most libraries with automation programs cited two major benefits:

- Improved operational control
- Ability to handle increasing workloads without staff increase.

To the extent that these are major problems throughout the whole community (and it is clearly evident that this is at least true of staffing), then a need for automation (or some equally viable solution) can be said to exist. Survey respondents overwhelmingly agree that automation will improve service to users (question 17).

Equipment. The survey revealed that about 43 percent of the Federal library respondents lack immediate access to computer equipment, i.e., there is no computer in their local agency. If a local computer facility cannot be justified, and if these libraries are to receive the benefits of automation, they must (1) utilize non-Federal local, regional, or national computer sources; (2) have on-line access to other Federal computers; or (3) have access to automated services through other Federal libraries or through Federal library service centers. The survey also reveals that, with minor exceptions, librarians who have automated are using local equipment that was not selected with library requirements in mind. In addition, if computers not presently being used were available for library automation then about 300 more Federal libraries could automate (question 16).

Condition of Existing Files. A major aspect of automating certain functions is the effort involved in preparing local file records for input and the conversion of these records. Questions about file maintenance were not specifically asked, but it is fair to assume that because of other critical problems, e.g., keeping up with cataloging, etc., coupled with severe staff shortages, local file maintenance suffers. In addition, 260 respondents reported inconsistencies in local cataloging as a major problem (question 30). It will not be enough to provide program packages or access to equipment unless there is parallel funding to support data preparation, editing, and conversion, where these are required.

Cooperative Development. Enough libraries have successfully automated to assure that it can be done. Furthermore, unless large-scale centralized automated centers are to be built, there are no critical technical problems to be solved. However, there are many important non-technical problems in the Federal community.

The administrative hierarchy of Federal libraries is built largely along agency lines. However, because of the large number of independent agencies, there are literally dozens of top managers with authority over Federal libraries at the highest level, and hundreds at the local level. Unless the Federal Library Committee is able to obtain some decision-making authority or is able to work with some other group with such authority, Federal library planning will remain ineffective.

Experience in other segments of the library community has shown that:

- Failure of cooperative projects is more often due to people problems than to technical problems.
- Where there is sound planning, cooperative projects can successfully supply automation byproducts to large numbers of libraries, e.g., in the Ohio College Library Center.
- There have been few successful "software" transplants and few successful attempts to use outside data bases, with the exception of standard data bases such as MARC.

Furthermore, with one exception (the Stanford-Columbia-University of Chicago "Collaborative Library System Development" project), none of these cooperative projects has covered an extensive geographic area. By contrast, Federal library automation planning would have to contend with a widely dispersed community.

Experience in non-Federal cooperative automation projects leads to the following conclusions for similar Federal projects:

- Strong central management will be essential, particularly to overcome the geographic barriers.
- Usable products must be provided.
- Funding beyond present library budgets will be required.
- It will be impossible to incorporate every library's idiosyncrasies in systems design.
- Existing software may not be generalized enough and new software will probably be required.

Long-Range Planning. If pilot projects are to be undertaken in support of Federal library automation, some prior formulation of the long-range goals will be useful. Is it our goal to provide automation (or access to automated services) for every Federal library or for some Federal libraries? If the latter, what are the priorities within the community? Will automation be accomplished entirely within the Federal government or will outside systems be included? What is the overall timetable? What are the timetables for specific objectives? Does the plan cover aspects such as training, staffing, systems development, administrative changes required, etc.?

Personnel Resources. Since 438 respondents (43 percent) had no local agency computer, it is fair to assume that they also would not have the personnel resources to implement library automation projects even if outside computer support were provided. Even those libraries with access to equipment report a number of personnel problems: high turnover, low priority of library work assignments, unfamiliarity with library requirements on the part of analysts and programmers, etc. Unfortunately, as these Federal programmers and analysts do gain familiarity with library data processing requirements, their expertise is often not utilized again except in further development and maintenance within the local library. Therefore, while there exists within the government a fairly sizeable group of people experienced in library automation, there is no mechanism for using this expertise to benefit other Federal libraries.

Other reports have identified the need to train Federal librarians in systems analysis and automation techniques.[1] This study did not specifically address that problem, but the findings corroborate the need; in almost every reported automation project, librarians represented a major personnel resource. Most survey respondents expressed the belief that library automation will not reduce staff size (question 17).

Automation Budgets. A major problem noted by many respondents is the uncertainty of funding. As one respondent put it, "An overall plan presumes a homogeneity of leadership and authority over a long time span. This is not a Federal condition!" Some respondents mentioned that certain automated operations had been cut back due to funding, even though they were fully developed and operational; others reported scrapping systems that were in the design or programming stage due to funding cuts. Funding for all library operations, with certain exceptions, appears to be obtained largely at the local level; many librarians reported that they did not even know what their budgets were, since they ask for purchase and staff approval as events occur rather than on an annual budget basis. Obtaining support for library automation is also a local decision; therefore, if automation is to have major impact, national programs will need high-level support to prevent their being thwarted by local agency administrators.

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[1] See, for example, the study by James J. Kortendick and Elizabeth W. Stone, Post-Master's Education for Middle and Upper Level Personnel in Federal Libraries and Information Centers: Final Report, American Library Association, Chicago, 1971.

The point was made earlier that automation should not be undertaken in Federal libraries that are under so much financial pressure that the extra commitment will undermine existing services. Rather, automation planning should stress the need for better funding for all aspects of library service.

Local Attitudes. Long-range Federal library planning must take into account the fact that the Federal library operates within a local agency. Massive promotional programs must be launched to promote better understanding of the library's role at all levels of government. Survey data indicate willingness on the part of librarians to improve local user services through centralized planning and programs at the national level.

Federal Library Automation Guidelines

The solutions to the basic problems raised above are entirely outside the scope of this project; many will require resolution at the highest levels of government. Our discussion of Federal automation alternatives in the next section will assume that the following statements are reasonable initial formulations:

- Library automation is itself desirable.
- Automation would materially improve the Federal library community's ability to serve its users.
- Library automation should be extended to as many Federal libraries as possible.
- It would be most beneficial for the Government--and ultimately the taxpayer--if Federal library automation were to be achieved in the most efficient manner.
- It is in the national interest for Federal libraries to achieve the maximum possible system compatibility, and to keep the overall system as independent as possible of agency structure.

- Federal library automation should be as compatible as possible with other segments of the library community.
- Federal library automation could take place within a reasonable length of time, using existing technology.

Based on these considerations, alternative methods for accomplishing Federal library automation are proposed and evaluated in the next section.

Alternatives

The alternatives presented in this section concern (1) standardization essential for automation; (2) automation implementation; and (3) selection of library functions for automation. These problems and the major alternative approaches to their solution are discussed below.

Standardization Alternatives. Alternative procedures for standardization are:

1. Each library should be encouraged to adopt standardized techniques.
2. Agency-wide standards should be mandatory for all libraries within that agency.
3. Government-wide standards should be set for all Federal libraries.
4. Standardization should be accomplished as a by-product of centralized automation.

Alternative 1 is the easiest to implement, since it requires the issuance of standards and the promotion of their adoption. Since adoption is only encouraged, there would be no penalties or enforcement for nonadoption. Efficient mechanisms would have to be developed to inform librarians of existing standards. A central library standards office could be organized within FLC to collect, disseminate, and promote existing standards; to provide assistance and training; to identify areas where standards will be required; and to encourage or undertake their development.

On the basis of past experience, it does not appear that this alternative will ensure standardization. The desire to make local changes prevails in use of LC cataloging, LC and decimal classification, MARC data, standard thesauri and subject heading lists, etc.

Alternative 2 would require some policing within the agency to ensure adoption of standards as they are announced. This plan would ensure a degree of standardization within an agency, but the problem of interagency compatibility would remain.

Alternative 3, like 2, would require some time, since so many people and so many past practices and future needs would have to be considered. However, the fact that the American Standards Institute has been able to effect standardization among far larger communities indicates that the task is reasonable if it is given support and authority. Benefits of standardization would include facilitation of automation, training programs, and information transfer, and increased transferability of staff. The latter would be particularly important in allowing the government to maximize its library resources to meet changing needs. Uniformity would make it easier to merge libraries (for example, several respondents to the FLAS are being merged with other libraries); to incorporate holdings of libraries that are being closed with other libraries (again, several respondents reported the closing of local libraries and transfer of holdings); and to facilitate government reorganization (such as has occurred with the creation of the Department of Transportation).

Alternative 4 is a possibility if the automation alternative elected is some type of centralized program. Automation is a powerful force for standardization. The best example of this may be seen in the effect of the MARC project. Although it has not been universally adopted and although there is neither enforcement of use nor penalty for nonuse, the following results have been achieved within a 2- or 3-year period:

1. For the first time, almost total compatibility with LC and BNB
2. Standardization of data input at the Library of Congress for diverse types of materials
3. Library of Congress adoption, to a large extent, of Anglo-American cataloging rules, even where these differ drastically (as in serials) from past practices
4. Adoption of MARC by a wide range of foreign libraries and library groups
5. Adoption of MARC by the American Standards Institute
6. Increasing uniformity of machine-readable catalogs developed since MARC
7. Use of MARC in commercial and noncommercial library service centers such as the Ohio College Library Center, Xerox Bibliographics, and the National Library of Canada.

This alternative says, in effect, "Here is an automated system. Data must be input as follows; output must be produced as follows (if you want to use the system)." In view of the many uncertainties involved in achieving standardization by the first three alternatives, this alternative--although still fraught with uncertainties--might, in fact, achieve results more quickly. In this approach, standards are developed from specific system requirements, adopted within the system, and then submitted for acceptance as government-wide standards for automated libraries.

Implementation Alternatives. Alternatives for implementation procedures are:

1. Each Federal library should assume responsibility for automation on its own time schedule.

2. Centralized support, including generalized software packages, should be made available to promote more rapid transition to automation within Federal libraries.
3. Agencies should set up automation centers to provide direct service and/or support for their libraries.
4. Government library automation centers should be located in various geographic regions to provide service and support.

Alternative 1 suggests that Federal libraries should automate just as they are presently doing. The advantage of this approach is that each library is allowed freedom to determine how it will automate. This would presumably be done in consonance with existing library operations, creating a minimum of local changes. The disadvantage is that compatibility will not be possible with this approach, unless it is coupled with a standardization alternative that enforces agency-wide or government-wide standards. Another disadvantage is that automation will be available only for those libraries that have local resources to support it. This approach also makes the poorest use of the scarce human resources in library systems analysis, design, and programming.

However, it may be necessary for some libraries to adopt this alternative. Unique considerations such as size, large collections of security classified materials, relationships to other library communities, etc., might be factors that would promote specialized automation.

Alternative 2 suggests that automation can best be achieved through centralized planning, design, and/or software development, but that installation and operation should be accomplished locally. The advantages of this approach are: savings of scarce human resources (e.g., a central staff writing a catalog software package instead of many local staffs); standardization of system input, logic, and output; distribution of development costs over many libraries; and extension of automation to those libraries unable to support local systems development. This approach requires some agency to undertake the project, develop funding mechanisms, select and manage the project staff, and establish mechanisms for obtaining system requirements input and review from knowledgeable members of the Federal library community (the review of existing library automation projects accomplished in this survey would aid in such identification).

The major disadvantages of this approach are the problems of software transferability and the uncertainty of product utilization. Both of these can be overcome with reasonable planning. Transferability problems exist with respect to both hardware and procedures. Software would, of course, have to be programmed in a language that is as machine-independent as possible. Even with such a language, problems arise because of the variability of equipment in different installations, the different software executives (or operating systems) under which computers operate, the local input and output requirements, etc. However, the MARC Pilot Project demonstrated the potential use of centralized computer software in the program packages that were distributed with the Pilot tapes. None of the participating installation were able to use all of the programs successfully; some installations were unable to use any of them. Some of the programs had design flaws. Still, the programs were to some extent useful. More recently, the installation of programs such as the commercial BATAB order system in various libraries affirms the potential of this approach, although BATAB has also given problems at some installations.

A second disadvantage relates to peculiarities in local operations. However, a review of dozens of automated systems indicates clearly that in terms of logic, all systems are basically alike. For example, circulation requires charging and discharging, which makes book and borrower identification necessary; overdue control presupposes an ability to detect an expired load period and to identify the borrower, etc. It is true that system requirements vary, e.g., one library may use a 2-week loan period and another a 3-week loan period, but all automated circulation systems are logically similar. The survey has identified--for cataloging, acquisition, serial control, and circulation--the major functions that are included in Federal automated systems. These are identical in most non-Federal systems. The functions less frequently automated in these areas might well be excluded from the basic "core" package and either implemented as additional features or left for local programming.

It is likely that use of generalized software will require some changes in local procedures. If there is sufficient communication with--and participation from--the Federal library community in setting basic operational requirements, automation can become a potent force for local standardization and acceptance of change.

Alternative 3 centers automation development at the agency level. The justification for this alternative is that it could be developed within existing organizational entities; adoption of systems could be encouraged or accomplished by administrative fiat; and, presumably, some compatibility already exists within the agency libraries. Disadvantages are that agency libraries are distributed throughout the U.S. and, in some cases, throughout the world; agencies have tended to neglect the coordination of their libraries, and a major shift of emphasis would be required; if development is left up to the agencies, there is no assurance that anything will be accomplished unless the agencies are themselves directed to accomplish it; and, unless there were interagency cooperation, compatibility across agency lines might be impaired.

Alternative 4 presupposes administrative decisions and changes to permit the provision of automation service, regardless of agency, through regional service centers. These centers could be either government organizations or such existing natural centers as commercial processing centers, large state or university libraries, or commercial service centers.[1] Participation could be voluntary or mandatory, or might vary depending upon the function. The benefits would be standardization of programs and routines at the centers, extension of support to libraries regardless of geographic location, and provision of services for libraries without access to equipment. Due to the large volume of work, which would permit efficient equipment utilization, volume buying, etc., these centers would also be economical as compared with local installations.

The disadvantage of this approach stems from the fact that a new structure would have to be created. This would not only take time, but would make Federal library automation dependent on a great many uncertain events. Another disadvantage is the high cost of data transmission, and the potential for errors in messages unless high-quality communication lines and error-correcting codes are used. This is particularly important for library processing, since it is difficult to detect errors in messages that do not consist of running text.

Functional Areas Alternatives. Alternatives for selection of functional areas are:

1. All library automation operations for which automation is feasible should be developed in a compatible manner, with timetables for priority areas.
2. Only those operations that impinge on the library's ability to communicate with other libraries should be included; other operational areas should be automated locally.

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[1] The selective dissemination of information (SDI) service operated by the National Science Library, in Ottowa, provides a good example of nationwide service from a single service center. The CAN/SDI system regularly processes seven major tapes, including ISI Source & Citation Tape, Chemical Titles, and MARC.

Alternative 1 aims at providing a comprehensive integrated series of software packages that would cover all library operations for which automation is feasible. This approach would enable libraries to select modules for use in their local installations as if they were in a library automation supermarket. The appeal of this approach is undeniable; its achievement is theoretically feasible. However, there are literally dozens of such modules for which analysis, design, and programming would be required, as well as documentation and training for local use. The difficulty with this approach is that while these operations can be automated, many are more sensitive to local conditions and hence less appropriate (and probably less successful) for generalized systems.

Alternative 2 narrows the areas for generalized packages to those operations that impinge most directly on interlibrary communications, e.g., common use of catalog data, data bases, etc. This approach concentrates the development effort on operations for which presumably more standardization already exists and for which generalized packages would have a greater potential for actual local use. In addition, if the development effort is accompanied by network planning, it could result in unified communications. This alternative is clearly easier to achieve than the first.

Recommendations and Conclusions

In planning for future Federal library automation, these alternatives should be considered in various permutations so that the most reasonable approaches for various library services can be identified. Even with the set of alternatives presented above, which does not exhaust all posibilities, the number of potential mechanisms for support of Federal library automation and standardization is extremely large. However, some approaches are more feasible, reasonable, and cost-effective than others. Of these, the ones that could be implemented without presupposing extensive changes in government structure should be given highest priority--not because such changes would necessarily be undesirable, but because effective Federal library automation should not be dependent on conditions that the library community itself cannot control. This assumes, therefore, that Federal library automation planning must cope realistically with less than ideal funding, organization, and standardization.

The standards recommendations are:

1. Government-wide Federal library standards should be a continuing goal of all Federal librarians and of the Federal Library Committee.
2. Preliminary standards should be effected largely as a byproduct of automated systems.
3. The FLC Newsletter should keep Federal librarians informed of standards, and promote and encourage interchange of ideas and problems concerning existing and needed standards.

Implementation recommendations are:

1. The importance, size, and geographic dispersion of the Federal library community warrants the development of regionally located Federal library computer-based service centers. Federal librarians should work toward this as a long-range goal.
2. A short-term goal, which is in consonance with the long-range goal, should be the development of standardized system specifications for basic library operations to support local Federal library automation and, where possible and effective, to develop standardized program packages based on these specifications.
3. In the near future a pilot project, based on one of these program packages, should be launched in the metropolitan Washington, D.C., area to test feasibility of centralization of support for selected Federal library activities; identify types of support services most amenable to central automation; and gather information about the resources required to implement similar programs at the regional level.

Library functional area recommendations are:

1. Resources will not be available to provide generalized software in support of all library automation operations; therefore such software should not be developed for operations peculiar to local conditions, e.g., circulation.
2. Efforts should be concentrated on library operations that impinge on interlibrary communication, for example, access to national data bases for enrichment of local services.
3. Efforts should be concentrated on areas that already have some degree of standardization, e.g., use of MARC data.
4. Automation support for a restricted number of functions with definite priorities will allow higher probability of initial success in developing generalized systems and centralized services.

CHAPTER VI. CONCLUSIONS AND RECOMMENDATIONS

This project has involved one of the most intensive investigations ever made of the Federal library community. Some of the findings are not startling, since they confirm the long-held views of many experienced observers of the Federal library scene. However, the empirical, substantiated evidence of some of these existing views helps to provide a sound basis for further exploration of the many facets of the community not surveyed in this study.

FINDINGS

The study produced the following general findings on the Federal library community:

- The vast majority of the libraries in the Federal library community are small or medium-sized.
- The vast majority of libraries have only from one to three staff members.
- Most Federal libraries receive inadequate financial support.

Some general findings that might not have been anticipated were as follows:

- Books and periodicals are considered of greater importance than technical reports and government documents.
- Very few Federal libraries provide centralized services to other Federal libraries.
- Most libraries hold a great variety of materials and attempt to provide a broad range of services.
- Federal libraries serve a very wide range of publics, including kindergarten children, minority groups, institutionalized persons, foreign nationals, students, the general public, and research scientists and technicians.

A number of important findings were specifically related to automation:

- Only a few Federal libraries have attempted to automate.
- Those libraries that are engaged in automation lack standardization in formats and codes.
- Federal and non-Federal library automation projects and systems are more similar than different.
- A wide range of computer equipment is utilized.
- Automation projects rely on local agency support for personnel.
- The Federal library community holds a strong positive attitude toward library automation.
- The idea of centralized automation support and services enjoys strong support.
- Notwithstanding these positive attitudes, Federal librarians do not rate automation *per se* above other critical needs such as budget, staff, space, and improved user service.
- Federal librarians have a strong practical orientation toward possible automation, preferring help for immediate needs over improvements with a longer-range payoff.
- Outside machine-readable data bases are rather widely used, considering the recency of development of such services.

CONCLUSIONS

On the basis of the survey evidence and corollary project work, the following conclusions were reached:

- To date, automation has made little impact on the total Federal library community.
- Communication about Federal library automation projects is poor; better direction and support are greatly needed.
- Present library manpower is not sufficient to mount a major automation effort within the community.
- If service is to be improved in the smaller Federal libraries, there must be central support for library automation.
- Generalized program packages could assist some libraries, but adequate use of these packages cannot be made at the local level unless additional funding is provided.
- If the community is to make extensive use of automation, the products must reach many, if not most, libraries by mail, on-line terminal, or other communication channels, since few of the libraries have adequate local computer facilities at their disposal.
- Use of centralized data bases is an accepted and promising approach, and should be vigorously promoted.

SPECIFIC RECOMMENDATIONS FOR ACTION

We believe that the Federal Library Committee, working with other appropriate agencies, should mount an aggressive program to support and encourage cooperative Federal library automation. This program should address itself to five major objectives:

- Development of generalized system components.
- Selective development of centralized services.
- Extension of service to the "forgotten publics" served by Federal libraries.
- Development of standards.
- Provision of effective communication mechanisms.

How can recommendations be implemented? In a recent study, Olsen points out two findings about cooperative programs. The first is that most cooperatives have stringent requirements for consensus and the central group refuses to attempt to influence members, thereby exercising a minimal leadership role in setting goals, resolving conflicts, and mobilizing resources. The second is that to date, the goals of most cooperatives are to "assist the member libraries in accomplishing their own goals, rather than to move the whole aggregation of libraries toward substantially different goals."[1]

Olsen's findings and the findings of this study, e.g., the underfinanced state of libraries and the strong expressions of need for centralized support, make it clear that the central planning group for Federal libraries should set standards, make decisions, and work toward directed goals for the entire community. However, communication is always more meaningful when discussion centers around an actual document, such as a proposed format, product, or system design. The central action group should assume the role of change agent by developing initial specifications, meeting with a representative group from the Federal library community, making modifications based on discussions with Federal library representatives, outside library representatives, and consultants, and formulating final specifications.

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[1] Olson, Edwin E. Interlibrary cooperation; final report. College Park, Md., University of Maryland School of Library and Information Services. Sept. 1970, p. 78.

This approach, if coupled with a strong emphasis on communication of plans, proposed approaches, discussion sessions, and final recommendations, should provide an opportunity for any librarian to make his opinions known. Therefore, it is recommended that full communication be encouraged in each of the following areas, but that full agreement not be a requirement for action.

Development of Generalized System Components

Chapter III of this report indicates that considerable effort has been expended in developing computer services for fewer than 60 Federal libraries (excluding the three national libraries). This development has primarily aided less than 3 percent of the total number of Federal libraries. Although survey respondents were not asked to provide development costs for these systems, it is reasonable to assume that the total cost for systems reported would amount to several million dollars. If we assume that the total automation cost to date for the 60 libraries is about three million dollars (probably a conservative estimate), it is obvious that if automation continues at the same rate, the cost for providing independent automation to the entire community could be over $200,000,000. In view of the many other critical unmet needs of Federal libraries--such as physical facilities, staff, and reference resources--this seems too high a price to pay for automation. Yet it is equally clear that many Federal libraries can substantially improve service with automation support, particularly for bibliographical services and technical processing. The case for selective, centralized development of system components for local use seems clear.

Local versus Central Program Development. Let us assume, for example, that a local Federal library wants to make full use of MARC tapes to improve its services. The installation of a local facility may be warranted because of local volume of activity and local computer services. However, each library that could justify such local use must:

1. obtain systems analyst and programming staff.
2. provide detailed understanding of the MARC tapes for all librarians, systems analysts, and programmers on the project.

3. design, write, and test programs for each desired product, e.g., selective dissemination of information, catalog card or book catalog production, provision of listings, development of edit, correction, and file maintenance routines, etc.

However, since all MARC tapes are identical in format and since the variety of outputs normally required is a small, finite number, much labor and computer time could be saved by providing the local Federal library with one or both of the following products:

1. A standardized system design showing all logical steps in block diagram form, with input, output, and programming specifications.
2. Standardized program modules, written in a higher-order programming language, for each major task for which MARC tapes could be used.

The first product would be used primarily by those libraries with access only to non-common computers; it would greatly accelerate their local program writing and testing. The second product would be available for local installation. Although some local modification might be required, this would be facilitated by good program documentation and consultation with the designers and analysts who prepared the program package.

The example above used MARC tapes, but the same situation prevails for use of all standard data bases, and for accomplishment of certain standard library routines. For example, many Federal libraries provide lists of serials holdings to aid research workers in identifying local holdings. These lists can be developed as a standalone system, i.e., they do not have to be integrated with the entire local serial control system. A standard program package for input of local data and printing of such lists could be made available. This approach would also allow libraries without access to computers to punch up their holdings and have them run on some other computer, i.e., in another agency, at a Federal library processing center, etc.

Specific Approach Recommended. In Section V we developed and discussed priorities for the automation of particular library functions and subfunctions. The functions, in order of priority, are:

- reference
- acquisitions
- cataloging
- serials
- circulation

We believe that the most desirable way to initiate the development of generalized system components is to take advantage of MARC, by building system components for reference, and/or acquisitions, and/or cataloging that use MARC input.[1] The rationale for centering on MARC is summarized below:

- The MARC data base can support a wide range of services that are potentially useful to the Federal library community and its patrons. These include the priority items identified in this survey: bibliography production, current awareness, book selection, and support to local cataloging.
- The MARC data base already exists and will continue to develop, through the Library of Congress; thus, no separate effort will be required to build a data base.
- MARC is the only current national automation standard that is potentially of use to most Federal libraries.
- Documentation about MARC is superior to documentation for most other data bases, and library staff with MARC experience are available within the Federal library community.
- As MARC expands its services, the Federal libraries will have even more use for MARC.

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[1] Other possibilities are standalone systems that produce useful local products without requiring extensive local conversion or redesign of existing operations. Examples of such products are serials title and holdings lists, journal routing control listings, and library statistical information.

The MARC system components would be developed through four major tasks, described below.

Task 1. Develop system requirements and specifications. In this task, the Federal Library Committee or its agent would determine specific Federal library needs for MARC output, including catalog cards, bibliographies, selective dissemination of information services, book processing materials (e.g., labels), book catalogs, etc. For each proposed product, one or more small workshops would be held to bring together Federal librarians representing all types of libraries, including those presently using MARC and those who have no such service. These workshops would provide an opportunity to see and discuss sample products, perhaps provided by the Library of Congress or some other library utilizing MARC, and to provide input for formulating the system requirements. A similar series of workshops proved effective in setting the standards for the MARC pilot project and greatly enhanced the subsequent acceptance of MARC.

On the basis of workshops and the initial requirements, MARC system component specifications would be developed. The resulting system specifications would not only serve as the input to the next task, but would be useful to the Federal library community by providing enough information about planned MARC system components to allow for local planning and preparation.

Task 2. Design components system. A detailed design for operational system components to generate MARC output products would be developed. This design would identify all of the logic and manipulation of MARC data that would be required to build files and provide the desired standard outputs and retrieval capabilities. This system design document would serve as an aid to libraries who were preparing their own local programs. To the extent possible, the system design should take into account other data bases and other library products and services not specifically included in the pilot effort, in order to provide, over time, a high degree of design compatibility among the various system components to be developed.

Task 3. Develop and test programs. A series of modular programs to provide file maintenance, printed output products, and search capability from MARC tapes would be developed, unless existing software could meet all or part of the system design specifications. These programs would be written in a machine-dependent language, such as PL/1 or COBOL, to facilitate widespread use. The programs would be tested, and output products would be provided to a pilot user group in the Washington, D.C. area and/or other selected areas. When final testing was completed, the programs and documentation would be made available to those Federal libraries prepared to use them locally. Adequate provision would be made, of course, for local training, installation and testing of the programs.

Task 4. Monitor use of programs. Local use of these components would be supported and monitored by the project staff, and the benefits and usefulness of the generalized system component approach would be analyzed to determine:

- Overall cost per component as compared with component use
- Problems in local utilization of components
- Benefits resulting from local use
- Modifications required to improve component software
- Recommendations for further work in developing generalized system components.

Selective Development of Centralized Services

The compelling need for support services for Federal libraries is a major finding in the Federal library survey. Federal librarians show skill and resourcefulness in utilizing current resources, but the great majority are unable to provide a level of service that by current library standards would be given a high rating. Provision of centralized support services could alleviate the current problems by:

- Reducing the workload of the local staff
- Extending the services provided to users by the local staff
- Sharing expensive or infrequently used materials
- Sharing subject and technical specialists among many libraries.

Although these services are not necessarily dependent upon automation, the use of computer-based services has proven effective in many centralized service centers. Furthermore, many services can be provided economically only through computer processing. These services include:

- Provision of book selection lists tailored to individual or group library selection profiles
- Provision of on-demand in-depth searches of Federal and non-Federal machine-readable data bases
- Provision of general bibliographies tailored to specific clienteles
- Provision of cataloging products such as catalog cards from MARC tapes
- Provision of SDI services for a variety of current data bases.

Local versus Centralized Service. Although the Federal Government has invested large amounts of money in supporting both Federal and non-Federal data base development, it has not provided collateral funding to ensure that its own libraries can access and use these valuable resources. Survey evidence clearly shows that if centralized service is not provided, the utility of these data bases, for the majority of Federal libraries and the agencies they serve, will be limited.

Access to data bases through centralized services has been provided in a number of non-Federal libraries. For example, the University of California is providing centralized data base access for its nine campus libraries. This approach has allowed them to centralize resource people (both librarians and computer technicians), reduce the investment in computer time and data base purchase, and provide centralized training as well as services.

Other kinds of service also lend themselves to centralized operation. For example, centers such as those in New York State and the Ohio College Library Center have demonstrated the economic and technical feasibility of providing a wide range of technical processing support from central service centers. Many of the centers, such as ANYLTS (Association of New York Libraries for Technical Services), plan annual acquisitions and catalog services of a magnitude greater than the current intake of monographs for the entire Federal library community, exclusive of the three national libraries. It is reasonable to assume that the Federal Government could also achieve these same benefits--and promote both increased standardization and a higher quality of service in its libraries--through selective centralized services.

As indicated in prior chapters, there are a few centralized data base services in the Federal library community, notably the AIM-TWX service of the National Library of Medicine, which provides daily, nationwide, remote on-line access from some 55 terminals to a sizable segment of the current MEDLARS file. Similar services could readily be provided for other data bases using any of several existing computer programs. It would also be a fairly simple matter to provide SDI service on a number of current data bases (i.e., tape services) using existing or easily adaptable SDI programs. Instead of running a new tape against 25 to 50 user interest profiles, as is now done in a number of Federal libraries, each tape could be run against thousands of profiles at a given time, with great economy of scale.

Centralized services other than those for retrospective search (retrieval) and SDI cannot be instituted without some special planning and development effort, particularly since there are fewer readymade library support programs outside of the retrieval and dissemination areas. However, the potential for other centralized service to provide cost-effective improvements to existing Federal library services is very high.

Specific Approach Recommended. The sequence of tasks to be accomplished in developing centralized services roughly parallels that given earlier for generalized system components. However, specific details will be different for each kind of service, and the time scale will be shorter for retrieval and dissemination services than for other kinds of services.

The following general sequence of tasks will apply to most of the centralized services.

Task 1. Identify target users and services. Pilot user groups should be identified on the basis of present survey data and some easily acquired additional information, to receive one or more of the initial services to be provided by the service center. Smaller libraries and libraries serving the disadvantaged should be well represented in the pilot groups. The analysis involved in this task will include consideration of both the expressed and implied needs of the pilot groups, e.g., for special bibliographies, demand searches, SDI, catalog card sets, or book selection listings. The analysis should also include consideration of any existing commercial or noncommercial services that might meet these needs economically. The end product of this task would be a statement of initial service requirements for the pilot groups of libraries.

Task 2. Design the service organization and system. A number of factors must be considered in setting up the service center, including space, funding, availability of computer support, and staff. The facility could be developed and operated by Government personnel, by contractor personnel, or by some combination of both. As indicated earlier, some of the necessary software for the facility is already available or can be adapted from available packages, both commercial and Federally owned. Other software will need to be developed, as necessary. The software should be selected (or generated) in accordance with carefully defined system specifications, to be developed in this Task. These specifications should indicate clearly how the system will meet user needs technically, bibliographically, and logistically.

Task 3. Develop and test the system. For this Task, the service center staff will acquire, adapt, or develop programs and procedures necessary to meet the specifications outlined in Task 2. They would also make plans to acquire, on a continuing basis, the data bases on which the facility will provide service. All programs and procedures should be thoroughly tested before service is initiated, and adequate provision should be made for the orientation and training of the target user groups, to ensure that they can use the centralized services effectively to enhance local services.

Task 4. Operate and monitor the pilot service operation. In addition to the day-to-day feedback and informal evaluation that occurs in most service operations, the service center (or the Federal Library Committee itself) should monitor the pilot operation carefully, developing information on such things as:

- User satisfaction
- Impact of service on local operations
- Types of service provided, by frequency, user satisfaction and cost
- Problem areas in development, maintenance, and promotion of service
- Technical, staffing or logistical problems, e.g., delivery of products
- Cost of service, by user, by work unit, etc.

Although the pilot center could not provide all possible automated products, it would provide an opportunity to evaluate the potential of centralized service. In addition, at some point in time, the parallel availability of generalized system components for local installation would provide an opportunity to determine whether both kinds of services are needed and viable, or whether one type of service is clearly preferable. This would provide useful information for long-range cohesive planning for the Federal library network.

It is desirable to identify a fifth Task, which can be carried out, in part, concurrently with the Tasks already described:

Task 5. Develop plans for extension of services. We envision the service center as a prototype for several possible regional centers that might eventually be required to provide cost-effective service to the entire Federal library community, which is widely dispersed geographically. After 12 to 18 months of pilot operations by the service center, and assuming the success we anticipate, it should be possible to begin laying the groundwork for expanded services, both in a technical and geographic sense. As part of this Task, the center staff would identify particular services to be added, particular technical requirements for system extension, and the projected costs for the establishment and operation of regional centers similar to the pilot service center. A vital factor in the decision to proceed--again, assuming a successful pilot operation--will be the communications, computer, staff, and facilities cost tradeoffs involved in maintaining and/or processing duplicate data bases at various geographical locations. The costs of both computer time and communications continue to drop each year, while those for staff and facilities continue to rise. Therefore, final decisions regarding service extensions should not be made until the service center has been in operation for some time and projections can be made for all likely costs and benefits.

Extension of Services to the Forgotten Publics

It is dangerous to generalize about users of Federal libraries. For example, if one lives in Washington, D.C., one tends to think of Federal libraries as large, well-funded collections serving researchers, scientists, and those in Government decision-making positions. However, if one lives in New Mexico, one might think of Federal libraries as small, underfinanced, one-person operations serving Indian children. Since so many previous studies have centered on libraries in the Washington area, there is a decided bias in Federal library literature toward the libraries that serve the scientific and technical community. However, attention should also be paid to the "forgotten publics" of Federal libraries--Indian children, students in small grade schools attached to overseas military posts, hospitalized veterans, men and women in prison, and handicapped or deaf persons--who are also Federal library constitutents.

It is conservatively estimated that at least 630 Federal libraries--or about 30 percent of the total--have such groups as their major patrons. Other Federal libraries may also serve these groups indirectly. The libraries listed in the Roster of Federal Libraries include:

- 220 libraries serving institutionalized persons, including the aged, the handicapped, and those in correctional institutions
- 47 libraries serving Indian children
- 2 libraries serving deaf children and adults
- 20 libraries serving U.S. school children
- 311 libraries serving children in overseas locations.

In addition, a number of other libraries not identified in the Roster, and therefore not included in this survey, fall into the above categories. For example, a number of Federal prison libraries are not listed, nor are other libraries identified by the Project Team. It is estimated that at least 100 additional Federal libraries provide direct service to the above groups.

In most cases, service provided to these essentially "captive" patrons of Federal libraries is minimal. SDC believes that new, centrally planned automation programs should include as one major objective the identification and provision of means to enhance the service provided. Essential tasks to be accomplished in this area include:

Task 1. Determine the extent to which Federal library service to these constituents falls below national library standards.

Task 2. Identify specific needs and determine automation services that can meet all or part of these needs.

Task 3. Develop new automation products specifically tailored to Federal libraries serving disadvantaged users.

Provision of Effective Communication Mechanisms

The Federal Library Committee needs to develop additional structures and stimulate and support greater interchange of information both to and from the field. Several mechanisms need to be explored, including the establishment of Federal Library State Committees (for states with large numbers of Federal libraries) and/or regional committees. Furthermore, some organizations are needed between the local and the national levels to provide adequate representation and focusing of local and regional needs. Their development would also set the stage for eventual state or regional service centers.

To provide for the communications mechanisms, it will be necessary to accomplish all or most of the following tasks:

Task 1. Develop a standard library automation project report form to identify and report on new projects.

Task 2. Establish mechanisms for reporting new projects and updating previous projects to keep the systems descriptions provided through the present project up-to-date and available to the community.

Task 3. Establish a mechanism for the preparation of reports and bibliographies relating to automation concepts, techniques, and equipment for dissemination through the Federal Library Committee's *FLC Newsletter* and other appropriate channels.

Task 4. Establish a depository collection of system documentation, reports, and projects. This collection would serve the Federal Library Committee, any associated project staff, and the entire Federal Library community.

Task 5. Provide for a resource staff to serve in an advisory role to Federal libraries planning automation projects, and also to serve as a "switching center" to direct inquiries to appropriate Federal libraries.

Task 6. Plan and conduct a national conference of Federal libraries and information center personnel, to consider potential programs and provide the necessary impetus for a coordinated approach to the problems facing Federal libraries.

The national conference recommended as Task 6 could serve as a vehicle to emphasize to agency administrators and to Congress the extensive services already being provided, the needs for the future, and the steps being planned and taken to bring about the necessary improvements. Legislators at both state and national levels have commented that librarians tell each other about their problems, but fail to tell anyone else about them--at least not in a systematic or purposeful way. The Federal Library Committee may wish to consider the possible need for a special information committee that could help to ensure that high-echelon administrators are regularly provided with substantive information concerning Federal library needs and plans.

Development of Standards

To support and encourage the development of library automation standards, comprehensive efforts should be made to collect standards now in effect in Federal libraries and agencies, national libraries, and in the non-Federal library community. This work should be carried out by a centralized group, either with the Federal Library Committee or related to it. The group would accomplish its work by carrying out the following essential tasks:

Task 1. Identify areas for potential development of standards.

Task 2. Establish committees or task forces to formulate and document tentative standards.

Task 3. Integrate accepted standards into all generalized system components and centralized services developed for Federal libraries.

Task 4. Disseminate information about standards to all Federal libraries and provide training, as necessary, in the use of accepted standards.

Task 5. Establish and maintain effective communication between the standards task forces and the group or groups who are developing generalized system components and/or centralized services for Federal libraries.

The central group concerned with standards should also develop effective liaison with the Z-39 library standards group and other pertinent committees of the American Standards Institute (for standards that are being developed nationally) to ensure that the general interests of the Federal library community are reflected in Committee deliberations.

ORGANIZATION, STAFF, AND SCHEDULE

We believe that all or most of the five major activities discussed above should be carried out by a single staff working in close coordination with, or directly responsible to, the Federal Library Committee. While it is not SDC's prerogative to specify how the proposed effort should be organized or staffed within the Federal government structure, it is clear that the Federal Library Committee already is charged with responsibility to achieve better utilization of library resources and facilities and to provide more effective planning, development, and operation of Federal libraries. Since it is the natural locus for Federal library community coordinated action, and has established communications mechanisms with the community, the Committee provides an appropriate organizational framework for the proposed effort.

We also believe that the proposed program should have a full-time staff. Even though some very significant results have been achieved in moving toward Federal library cooperation through the use of committees, automation projects typically do not thrive under this kind of work arrangement. Furthermore, it is unlikely that any great impact can be made on automation in Federal libraries solely through committee action. System analysis design, programming, training, and implementation of new services will demand full-time effort over a fairly long period of time. It should be pointed out, however, that not all tasks must be accomplished directly by the automation program staff: specific assignments could be given to Federal libraries, to committees, or to contractors. However, centralized coordination and guidance are essential.

The size and composition of the automation project staff will be a function of the magnitude of the project selected by the Federal Library Committee for the next phase. It is clear that the project director should have library automation experience, preferably in Federal libraries; it is also clear that the staff should be experienced in library systems analysis and design, computer programming, training, and public relations. (Most new programs cannot simply be offered; they must often be "sold." A good public relations program at the outset can help the user bridge the gap between old and weak--but familiar--operations, and improved but unfamiliar ones.) A staff of five or six persons, in all, would be sufficient to begin the work outlined above, but extensive systems software development and the operation of a pilot services center would eventually require more staff or external (e.g., contractor) support.

It is perhaps unrealistic to assume that enough funds can be diverted from present Federal library budgets to mount an aggressive program. Since there are both experimental and operational service aspects of the five-part program we have outlined, it may be possible to obtain funds from several Federal sources; funding might then reach a level that would permit aggressive staff action and rapid progress on the prototype generalized system components, the pilot service center, and the special services, communications, and standards work. As indicated below, some parts of the service center--e.g., retrieval or SDI service--could be in operation in less than 90 days, and could thereby help to provide high visibility for the program during the period when the longer term efforts are taking shape. It would be desirable to fund the program at a level permitting both the short-term, high-visibility efforts and the longer term efforts to proceed concurrently.

For some kinds of services, computer time and communications costs could be major items of expense. We assume, however, that since the generalized system components would be developed for particular types of computers in common use in the Federal government, the program staff would be able to obtain sufficient computer time for program development and checkout at minimal cost. We also assume that users would be able to use the facilities of the Federal Telecommunications Network for remote-access services. There would be little or no cost, of course, for data bases (such as ERIC) produced by the Federal government. Detailed cost estimates can readily be prepared, once there is general agreement on the scope of the work to be undertaken, and once the priorities among or within the five proposed activities, if any, are established by the Federal Library Committee.

We would recommend that the schedule for the activities outlined above be reasonably demanding and that work on the proposed program be initiated with a minimum of delay to take advantage of the impetus that can be provided by the findings in this report. The history of national information system planning for science and technology indicates that, reports on the status of information activities tend to age quickly and, unless action follows, give rise to needs for new status reports.

Millions of dollars have been spent over the past few years to support improved service in public, school, and college and university libraries, and many large-scale automation projects have been supported by Federal funds. These actions can be viewed as an expression of Government interest in the status of our Nation's libraries. The time has come for the Federal government to give greater attention to the state of its own libraries, through programs designed to make Federal libraries capable of assuming an effective role in the Federal process. We believe that the results of the present study provide a solid base for action by the Federal library community, and that the vital interests of this community require the maximum possible continuity of effort.

APPENDIX

APPENDIX

TABULATIONS FOR THE GENERAL AUTOMATION QUESTIONNAIRE

The purpose of this appendix is to present the data from the survey. The SDC project staff's interpretation of these data are presented in the main body of this report. In cases where respondents appeared to have interpreted questions in different ways, some discussion is provided here so that the reader may take this into account in examining the data.

To permit the clearest possible presentation of the resulting data, several questions are displayed somewhat differently than they were in the printed questionnaire. In these cases brackets are used to identify material that is not part of the printed questionnaire. The following guidelines are provided to assist the reader in interpreting the tabular material.

1. The total number of returns included in the data base was 964. Not all sections and individual questions were applicable to all libraries; therefore, the number of respondents [N] varies with each question. The appropriate N is given whenever percentages or medians are used in the tabulation.

2. Whenever appropriate, data are presented by median, first quartile, third quartile, and range. These are abbreviated throughout the tables as M, Q1, Q3, and R.

3. Respondents were requested to rank the desirability of a given choice in questions 5, 20, 27, 35, 40, 43, 44, and 53. Although the majority of respondents did rank (i.e., 1, for the most important item; 2, for the second most important item; etc.), some respondents provided ratings instead (i.e., 1, for the several choices considered most important; 2, for the several choices considered next most important, etc.). In order to retain the original judgments of the respondents, results are presented separately for the rankings and ratings. (The ranking part of the question has been changed to "Please rate..." for display purposes; in the original phrasing, only the work rank was used.)

4. The questionnaire included open-ended questions and comment sections. For many questions, respondents could add choices other than those provided. These responses were tallied manually. Illustrative results are presented in brackets.

5. All of the ranges shown in figures are to be taken literally. For example, $1-5,000,000 means one dollar to five million dollars, not one million to five million dollars.

SECTION 1

LIBRARY STRUCTURE AND RELATIONSHIPS WITH OTHER ORGANIZATIONS

Several ways of categorizing or classifying Federal libraries are being explored in this study. The first series of questions, therefore, asks you to describe your library by indicating its type, structure, collection, and relationships to other libraries.

FEDERAL LIBRARY SURVEY

The following definitions and instructions are provided as guidelines:

Automation. Implies the use of data processing equipment, primarily computers or electrical accounting machinery (sorters, collators, etc.), to support library operations. For purposes of this survey, include systems in which microforms are automatically manipulated for storage, selection, and retrieval, or in which microforms are produced as output from a computer operation. Do not include more conventional microform handling equipment (e.g., reader-printers).

Administrative Levels. Includes four defined levels to encompass organizational entities such as offices, bureaus, or departments. Only those applicable to your situation should be considered in completing the questionnaire.

a. Your Library (e.g., Coastal Engineering Research Library)
b. Local-Agency--the unit to which your library is attached, or in which the administrative superiors with whom you interact directly are located (e.g., Coastal Engineering Research Center).
c. Parent-Agency--the level immediately above the local, in which the administrative superiors with whom you generally do not interact are located (e.g., U.S.Army Corps of Engineers).
d. Department--all other levels above parent agency, up to a major government division (e.g., Department of Defense).

Multi-organizational Relations. Answers should reflect the administrative organization or agency from which the majority of funds and policies are derived and for which the collection and services provided are a prime responsibility.

All responses to this questionnaire will be treated as strictly confidential. Completed questionnaires will be used only by the SDC project staff and will be destroyed after data analysis has been completed.

PLEASE RETURN THIS QUESTIONNAIRE WITHIN TWO WEEKS OF RECEIPT, SO THAT FOLLOW-UP WILL NOT BE REQUIRED.

Please complete:
Library Name ____________________
Address ____________________
Local Agency ____________________
Department ____________________
Contact Person ____________________ Telephone ____________

1. Please indicate which one of the following types your library is most nearly like.

Technical, special (including medical) or research library	501	52%
College or university library	28	3%
Public, general reading or recreation library	324	33.7%
School (elementary or secondary) library	160	16.6%
Archival or depository library	15	1.7%

[N=964; respondents could check more than one choice.]

2. Check one of the following statements that best describes the administrative relationship of your library to other Federal libraries. For the purpose of this question, administrative control implies some formal direction in materials selection routines, technical processing routines, budgeting, or centralized purchasing and cataloging.

My library is not under the administrative control of another Federal library.	579	63.4%
My library has administrative control over other Federal libraries.	18	2.0%
Number of libraries administered M=6; 1Q=2; 3Q=11; R=1-33		
My library is under the administrative control of a central agency library.	309	33.8%
My library has an administrative relationship with a non-Federal library, e.g., university library.	4	0.4%
*My library is under joint administrative control.	3	0.3%

[N=913]

*[The asterisked choice was added during the preliminary data preparation stage to accommodate those respondents who checked more than one category, e.g., both under control of a central agency library and a non-Federal library.]

3. Does your library have branches or separately housed reading rooms?

Yes	211	21.9%
No	753	78.1%

Number (of branches or separately housed reading rooms)

M=2; 1Q=1; 3Q=3; R=1-33

[N=964]

	M	1Q	3Q	R
4. Estimate the total number of holdings (including all types of materials) [N=933]	16,500	9,000	33,000	10-10,000,000
Estimate the percent of total holdings that are in microform [N=229]	2%	1%	10%	1-97%

5. Estimate the size of your collection and the annual acquisition rate for the following types of materials. Include in the total both hard copy and microform holdings. [Part 1: Total Titles]

	Total titles in collection				
	Under 5,000	5,001 to 20,000	20,001 to 50,000	50,001 to 200,000	Over 200,000
TYPE OF MATERIAL					
Books	280	454	137	46	12
Serials and periodicals (titles)	827	34	12	4	0
Technical reports	375	57	21	21	17
Government documents (other than technical reports)	528	46	14	11	4
Maps and charts	502	10	5	9	3
Films, filmstrips, and videotape	344	6	1	2	1
Pictures, transparencies, and photos	345	12	2	3	1
Phonorecords, tapes, and cassettes	511	11	0	1	0
Models and displays	210	2	2	0	0
Manuscripts, laboratory notebooks, etc.	212	6	1	2	1

5. Continued

	Total titles in collection				
	Under 5,000	5,001 to 20,000	20,001 to 50,000	50,001 to 200,000	Over 200,000
TYPE OF MATERIAL					
Pamphlets and reprints (off-prints)	546	36	6	2	1
Specifications, standards, etc.	250	16	7	5	1
Internal reports, intelligence reports, research reports, progress reports, etc.	341	22	7	4	2

[Respondents also identified the following types of materials: translations, directories, patents, catalogs, vertical file, microfiche, archival publications. None was ranked significantly over the given categories.]

5. Estimate the size of your collection and the annual acquisition rate for the following types of materials. Include in the total both hard copy and microform holdings. [Part 2: Annual Acquisitions]

	Total titles added annually				
	Under 1,000	1,001 to 5,000	5,001 to 10,000	10,001 to 50,000	Over 50,000
TYPE OF MATERIAL					
Books	588	207	21	5	0
Serials and periodicals (titles)	736	24	1	0	0
Technical reports	339	48	11	14	2
Government documents (other than technical reports)	465	25	9	7	0
Maps and charts	417	3	1	1	1
Films, filmstrips, and videotape	285	2	1	0	1
Pictures, transparencies, and photos	286	3	1	0	0
Phonorecords, tapes, and cassettes	417	5	0	0	0
Models and displays	169	0	0	0	0
Manuscripts, laboratory notebooks, etc.	178	2	0	0	1

Use or disclosure of proposal data is subject to the restriction on the title page of this Proposal.

5. Continued

	Total titles added annually				
	Under 1,000	1,000 to 5,000	5,001 to 10,000	10,001 to 20,000	Over 50,000
TYPE OF MATERIAL					
Pamphlets and reprints (off-prints)	454	20	1	0	0
Specifications, standards, etc.	218	6	3	1	0
Internal reports, intelligence reports, research reports, progress reports, etc.	282	6	6	1	1

5. In the third column, rank the types of materials by order of importance in your library (use 1 for the most important, 2 for second most important, etc.). Rank as many as you can. [Part 3: Ranking and Rating]

TYPE OF MATERIAL	RANKING						
	1	2	3	4	5	6	7
Books	494	135	510	22	6	2	2
Serials and periodicals (titles)	125	371	87	44	20	11	6
Technical Reports	46	33	67	42	22	13	38
Government Documents (other than technical reports)	30	29	83	85	63	28	33
Maps and Charts	2	3	18	55	54	59	75
Films, filmstrips, and videotapes	5	65	44	11	15	13	31
Pictures, transparencies, and photos	2	2	23	40	32	19	47
Phonorecords, tapes, and cassettes	1	27	172	66	31	13	26
Models and displays	2	0	0	3	5	10	47
Manuscripts, laboratory notebooks, etc.	4	1	2	5	6	6	43
Pamphlets and reprints (off-prints)	4	10	60	83	77	49	52
Specifications, standards, etc.	5	7	6	9	21	13	41
Internal reports, intelligence reports, research reports, progress reports, etc.	10	12	13	23	26	22	49

5. In the third column, rate the types of materials by order of importance in your library (use 1 for the most important, 2 for second most important, etc.). Rate as many as you can. [Part 3: Ranking and Rating]

TYPE OF MATERIAL	RATING			
	1	2	3	4
Books	57	11	2	2
Serials and periodicals (titles)	29	26	7	3
Technical Reports	13	16	7	3
Government Documents (other than technical reports)	13	18	9	7
Maps and Charts	7	11	8	9
Films, filmstrips, and videotapes	2	20	5	3
Pictures, transparencies, and photos	2	16	4	6
Phonorecords, tapes, and cassettes	4	12	5	5
Models and displays	1	6	5	4
Manuscripts, laboratory notebooks, etc.	3	4	3	7
Pamphlets and reprints (off-prints)	8	14	16	9
Specifications, standards, etc.	8	7	11	4
Internal reports, intelligence reports, research reports, progress reports, etc.	6	11	6	7

6. Please give your best estimate of your library's expenditures during the last fiscal year for:

	M	1Q	3Q	R
Book and non-book materials [N=825]	$6,000	$2,925	$12,000	$25-$2,200,000
Personnel, full and part-time [N=769]	$20,000	$11,000	$34,437	$1-$2,800,000
Equipment and supplies [N=708]	$757	$300	$2,000	$5-$100,000
Contractual services [N=274]	$1,200	$500	$3,525	$10-$200,000
Other [N=128]	$867	$435	$3,500	$10-$576,500

7. Please indicate the size of your library's paid staff in full-time (as defined in your organization) equivalents (FTE). Include part-time staff, e.g., two half-time staff members equal one full-time worker. [Part 1]

	M	1Q	3Q	R
Professional				
1410 (Librarian Series) [N=650]	1.0	1.0	2.0	0.5-37
1412 (Information Specialist) [N=37]	1.0	1.0	2.0	1.0-88
Other* [N=56]	2.0	1.0	3.0	0.5-20
Subprofessional [N=465]	1.0	1.0	3.0	0.5-40
Clerical [N=499]	1.0	1.0	2.0	0.5-40
Contractual [N=28]	1.0	1.0	2.0	0.5-18

*[Respondents identified the following additional professional series:

132-Intelligence Series
170-History Series
1015-Museum Curator Series
1045-Translator Series
1083-Technical Writing and Editing Series
1084-Visual Information Series
1320-Chemistry Series
1420-Archivist Series
1515-Operations Research Series
1710-Education and Vocational Training Series
1720-Education Research and Program Series

In addition, military personnel categories were included. However, all 56 respondents to this question did not identify a series.]

7. Indicate the number of budgeted positions that you have for: [Part 2]

	M	1Q	3Q	R
Professional [N=750]	1.0	1.0	2.0	0.5-200
All Other [N=662]	2.0	1.0	4.0	1.0-500

8. Most libraries interact with other libraries for reference support, interlibrary loans, technical processing assistance, etc. Indicate by checking, for the services listed, your library's interactions with each of the following national, local, or non-local kinds of libraries:

KINDS OF LIBRARIES	Exchange of materials for collection	Interlibrary loan	Catalog cards or other cataloging support	Abstracting and indexing support	Photocopying	Reference assistance	Acquisitions assistance	Systems analysis, design, or implementation assistance	Data processing services
NATIONAL OR FOREIGN LIBRARIES:									
Library of Congress	79	266	311	22	104	110	20	1	1
National Library of Medicine	19	223	16	43	130	86	9	1	7
National Agricultural Library	13	113	4	3	54	36	5	0	0
National or governmental libraries of foreign countries	40	48	5	5	27	27	6	0	1
LIBRARIES WITHIN YOUR LIBRARY'S LOCAL AREA:									
Other libraries in your agency or department	281	464	76	33	186	293	110	7	3
Other Federal libraries	186	459	15	22	184	263	54	4	7
Libraries of State and local agencies	90	375	8	12	134	181	29	1	0
Non-governmental libraries (i.e., public, university, business, etc.)	122	497	9	19	205	286	41	4	2
LIBRARIES OUTSIDE YOUR LIBRARY'S LOCAL AREA:									
Other libraries in your agency or department	231	417	77	39	190	230	101	10	7
Other Federal libraries	142	384	10	25	173	186	48	3	3
Libraries of State and local government agencies	66	278	1	10	115	121	25	1	0
Non-governmental libraries (i.e., public, university business, etc.)	80	399	7	14	180	174	36	4	1

9. In the table below are listed several major library functions or policies. Each may lie entirely within your responsibility as the head of your library, or final approval may be required (at least in part) from some person at an organizational level outside your library. Please describe the situation in your library by checking the highest level of approval required for each function or policy.

FUNCTION OR POLICY	(1) You have authority	(2) Approval required at local level	(3) Approval required from above the local level	(4) Check here if higher authority (columns 2 or 3) is a librarian
Approval for purchase of individual library materials	504	348	125	89
Selection of materials	738	168	60	42
Technical processing policy	618	66	143	95
Reference service policy	776	59	49	39
Circulation policy	737	115	70	51
Planning and implementing automation	138	215	242	72
Personnel administration policy(other than that established by Civil Service)	314	352	100	23
Other major functions or policies (specify)*	12	23	12	8

*[The major other functions specified by respondents were budget-related; others included training policies, administrative regulations, and more specific aspects of a given function (e.g., cataloging and classification of Federal publications).

Some respondents provided multiple responses for a given function or policy (e.g., columns 1 and 2 or 2 and 3); however, only the highest approval required is recorded in the data presented above.]

10. Many libraries participate in formally established cooperative groups or networks to provide mutual support and assistance. Is your library a part of such a formal cooperative network (other than the interlibrary loan) with other libraries?

Yes	101	10.5%
No	863	89.5%

[N=964]

[**Data reported** in questions 10-14 are only for those respondents who indicated that libraries outside their own agency were also participants in the network. In this way, some distinction could be maintained between administrative relations among libraries in one agency and non-agency-based networks.]

11. Please estimate the number of the following kinds of libraries that are members of your formally constituted network(s).

	Number of Libraries									
LIBRARY TYPE	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
Federal libraries in your agency or department	35	10	3	6	3	1	2	2	0	7
Federal libraries outside your agency and department	23	1	1	0	0	1	1	1	0	1
Libraries of State or local government agencies	17	0	0	0	1	0	0	0	0	0
Academic (college and university) libraries	26	5	1	0	0	0	0	0	0	0
Non-governmental special and technical libraries	15	2	2	3	1	0	0	0	0	0
Public Libraries	18	1	0	0	1	0	0	0	0	1
School (elementary or secondary) libraries	4	1	3	0	0	0	0	0	0	2

12. Are most of the other member libraries in the network within the local area (i.e., within 50 miles) of your library?

Yes	29	28.7%
No	72	71.3%

[N=101]

13. Does the network have a central headquarters?

Yes	75	74.2%
No	26	25.7%

[N=101]

If "Yes", please identify this headquarters:

[Examples of network headquarters follow:

- Northeastern Pennsylvania Bibliographic Center
  King's College
  Wilkes Barre, Pennsylvania

- Southern Oregon Library Federation
  Medford, Oregon

- Miami Valley Cooperating Libraries
  Wright State University
  Dayton, Ohio

- OTIS (Oklahoma Teletype Interlibrary Service)
  Oklahoma State University
  Oklahoma City, Oklahoma

Most of the Regional Medical Library programs (e.g., at Wayne State University in Detroit, and at College of Physicians in Philadelphia) were also named. Some networks had no headquarters at all (e.g., the Council of Research and Academic Libraries of San Antonio--CORAL).]

14. On the list of activities below, please check one column or the other to indicate the operational status of each activity carried on by the network(s) to which your library belongs. Leave both columns blank if an activity is neither being planned nor performed.

ACTIVITY	Currently Performed or Planned
Centralized acquisition services	45
Centralized cataloging services	51
Other centralized technical processing services	33
Centralized reference services	42
Training courses or seminars for members	51
Preparation and maintenance of a union catalog or list	64
Preparation of subject bibliographies	53
Preparation of indexes or other special bibliographic tools	32

[Respondents indicated whether an activity was currently performed or definitely planned; through an error in processing the data, however, only totals were possible.

No significant number of additional activities (planned or performed) was reported.]

15. The following table presents a list of library functions. First, check all functions currently performed in your library. If a function is now partially or completely automated, check the second column. If an automation project is now definitely being planned or is under development for a function, check the third column. At the bottom of the table, add any other additional functions that you perform, and indicate their automation status.

FUNCTIONS	Library performs the function	Now partly or completely automated		Automation definitely planned or under development	
Selecting and ordering library materials and/or control of acquisition funds and expenditures [N=856]	856	18	2.10%	12	1.4%
Cataloging and indexing, including production of cards lists, indexes, and book catalogs [N=684]	684	45	6.6%	26	3.8%
Serials and periodicals control, e.g., subscriptions and/or check-in, and/or preparation of holdings lists, and/or routing [N=825]	825	33	0.40%	23	2.7%
Circulation (including interlibrary loan) and/or document control [N=854]	854	21	2.5%	15	2.0%
Selective dissemination of information (SDI) [N=303]	303	17	5.6%	11	3.6%

15. Continued

FUNCTIONS	Library performs the function	Now partly or completely automated		Automation definitely planned or under development	
Preparation of bibliographies [N=680]	680	24	3.5%	18	2.6%
Abstracting and indexing[N=249]	249	15	6.0%	11	4.4%
Booking of films or other audio-visual materials [N=276]	276	3	1.1%	2	0.7%
Information retrieval from a machine-readable data base* [N=25]	25	12	48.0%	13	52.0%
Information retrieval from a microform data base** [N=30]	30	4	13.3%	5	16.7%
Other (specify) ________					

* If your use of machine-readable data involves access by any means to a data base in which input maintenance is not your responsibility, do not count this as automation in your library. This use will be explored in a later question.

** Information retrieval that involves search and retrieval of microforms through a keyboard device and/or computer is considered automation.

[The data presented in columns 2 and 3 do not accurately represent the automation status for each function. A discussion of the reasons for the discrepancies between these data and the number of planned and operational systems identified in Question 2 is presented in Chapter III of this report.

No significant number of other applications were reported.]

SECTION II

LIBRARY CAPABILITIES FOR AUTOMATION

The next set of questions explores the capabilities or potential resources of your library for automation. Automation implies the use of data processing equipment (punched card, key punch, collators, etc.), computers, automatic selection and retrieval of microforms, on-line terminals, etc.

If you have an automated system that is operational or is definitely being planned, skip the following question and go to Question 17.

16. Check any of the following statements that apply to your situation:

There is a computer in my local agency.	285
There is no computer in my local agency.	438
I have been informed that the computer could be made available for library operations.	76
I have not explored the possibility of using the computer for library operations.	381
I have been informed that systems analysts and programmers could be available to assist in developing an automated library system.	53
I have not explored the availability of systems analysts or programmers.	358
I have applied for and not received funds for automation planning.	35
I have not explored the availability of funds for automation planning.	394

[The most frequently provided comment was that the library is too small. Representative examples of comments follow:

> The possibility of using automation was investigated two years ago; felt it too expensive for the small benefits expected.
>
> Library is too small to warrant shared time on our problem-ridden computer.
>
> Use of local computer not feasible because of distance and low priority.
>
> Library needs materials more than automation.
>
> Computer is not available for library operations.
>
> One test printout was produced two years ago and the programmer quit.]

17. Indicate for each statement below, the response that best reflects your attitude regarding automation. Check one answer for each statement.

STATEMENT	Agree Strongly	Agree	Disagree	Disagree Strongly
Automation of some library operations is inevitable.	399	423	51	8
Because Federal libraries are often different from other libraries, Federal libraries probably would not be able to use automated systems developed in non-Federal libraries.	32	171	514	111
Library automation will probably reduce operating costs.	79	369	343	61
Library automation will probably reduce size of staff.	37	199	539	79
The cost for automating is too high for the average Federal library to bear by itself.	213	481	115	11
Centralized planning is a necessity if more than a few Federal libraries become automated.	250	513	56	3
Many libraries are not in favor of library automation.	45	410	300	13
Library automation will help improve service to users.	189	520	95	12
Library automation will allow computer people to take over libraries.	6	31	623	163

17. Continued

STATEMENT	Agree Strongly	Agree	Disagree	Disagree Strongly
Each Federal library is so unique that a centralized automated system or network is not desirable.	21	140	551	81
The Federal Library Committee should provide more support to individual Federal libraries in automation planning.	82	530	103	7
Being part of an automated system would enhance the prestige of the Federal librarian.	47	348	320	25
Most Federal librarians are reasonably well informed about automation programs in other Federal libraries.	6	161	554	74
Reporting on developemnts among libraries within the same agency is generally good, i.e., we know what is going on.	76	421	255	58
Reporting on developments between libraries in different agencies is generally good.	42	304	395	64
More mechanism should be developed to promote better exchange of information between Federal libraries.	163	585	45	5

18. In general, how do you feel your staff would react to automation in your library? (If you are the only staff member, check the last item).

enthusiastic	78	8.5%
willing	272	29.5%
neutral	139	15.1%
negative	47	5.1%
hostile	5	0.5%
don't know	80	8.7%
only one staff member	302	32.7%

[N=923]

19. If you were to approach your local administration with a request for automation planning, indicate in each of the following situations what you feel the response would be.

a. In planning for my library only, my administration would:

provide support and encouragement	208	23.1%
not provide support but would not object	133	14.7%
react favorably, but would want to assume responsibility for planning or control	63	7.0%
react unfavorably	168	18.6%
don't know	330	36.6%

[N=902]

b. In planning cooperatively with other agency or non-agency libraries, my administration would:

provide support and encouragement	270	32.2%
not provide support but would not object	149	17.6%
react favorably, but would want to assume responsibility for planning or control	59	7.0%
react unfavorably	59	7.0%
don't know	361	43.0%

[N=839]

20. Several alternative methods for extending and improving automation in the Federal library community are listed next. Read through the list and check the appropriate column to indicate your response to each alternative. [Part 1.]

ALTERNATIVES	Desirable	Undesirable	No Opinion
Each library should develop its own automated system, with a minimum amount of centralized support or control.	131	523	151
A central group of Federal library system analysts and librarians should be established to visit and consult with individual libraries or groups of cooperating libraries to assist them in developing their own automated systems.	543	136	134
Automated Federal library service centers should be developed to serve all Federal libraries in a geographical region or area, thus relieving individual libraries of the need to develop basic automated systems of their own.	492	171	139
Centralized, automated Federal library networks should be developed or improved on an agency or department basis, thus relieving individual libraries of the need to develop basic automated systems of their own.	545	116	131
Standardized program packages and operational procedures should be developed for the automation of certain library operations such as printing catalog cards and book catalogs, maintenance and printing of serials holdings lists, etc. These could be made available to Federal libraries and could be modified to suit local needs.	667	44	96

20. Continued

ALTERNATIVES	Desirable	Undesirable	No Opinion
The national libraries and other key Federal libraries should be given responsibility and funds for developing automated networks with a complete range of services to support all Federal libraries, thus relieving individual libraries of the need to develop automated systems of their own.	459	153	160
Federal libraries should be permitted to join existing or planned automated networks for non-Federal libraries, rather than develop their own automation programs or wait for automated Federal library networks.	282	253	236
Other (specify)____________________			

[Very few alternatives were specified; sample suggestions follow:

Federal libraries with similar interests should cooperate.

I think several of these alternatives should be considered, then acted upon.

Automation nets should be for particular types of libraries (e.g., engineering, health) within government and for particular regions.]

20. Then, go through the list again and rank those alternatives that you have checked as desirable. Rank the most desirable alternatives as "1", the second most desirable as "2", and so on. [Part 2.]

ALTERNATIVES	RANKING						
	1	2	3	4	5	6	7
Each library should develop its own automated system, with a mimimun amount of centralized support or control.	47	24	10	7	12	13	25
A central group of Federal library system analysts and librarians should be established to visit and consult with individual libraries or groups of co-operating libraries to assist them in developing their own automated system.	84	85	58	46	48	32	7
Automated Federal library service centers should be developed to serve all Federal libraries in a geopgraphical region or area, thus relieving individual libraries of the need to develop basic automated systems of their own.	90	94	111	53	22	6	2
Centralized, automated Federal library networks should be developed or improved on an agency or department basis, thus relieving individual libraries of the need to develop basic automated systems of their own.	129	135	77	56	16	5	1

20. Continued

ALTERNATIVES	RANKING						
	1	2	3	4	5	6	7
Standardized program packages and operational procedures should be developed for the automation of certain library operations such as printing catalog cards and book catalogs, maintenance and printing of serials holdings lists, etc. These could be made available to Federal libraries and could be modified to suit local needs.	160	143	101	54	35	9	2
The national libraries and other key Federal libraries should be given responsibility and funds for developing automated networks with a complete range of services to support all Federal libraries, thus relieving individual libraries of the need to develop automated systems of their own.	75	70	76	68	39	17	4
Federal libraries should be permitted to join existing or planned automated networks for non-Federal libraries, rather than develop their own automation programs or wait for automated Federal library networks.	33	40	37	42	47	26	9

21. Check any of the following factors that you feel have significantly delayed or would significantly delay or prevent automation in your library. Even if you have never considered automation, your response will still be useful as a judgmental assessment of problems that might be encountered.

Library is too small	716
Library operations are too complex	43
Persons trained in automation are not available	335
Higher authorities are not interested	122
Library is too isolated geographically	157
Library staff is not interested	40
Do not see how automation could improve our library's services	168
Library automation has not yet been proven cost/effective	180
Funding is inadequate to support automation planning or development	519
Other (specify)________________________	54

[Other factors reported included the following:

Lack of staff and staff time for planning.

Not even allowed a reprint machine.

Library operations are considered overhead and have low priority.

There are higher priority activities in Department.

The combat situation.]

22. One important aid to automation planning can be the appraisal of the experiences of other automation projects. In a number of instances, automated operations have been phased out because of insufficient preliminary system analysis and design, lack of management interest, change of computer systems, loss of funding or key personnel, poor operating performance, availability of automated support from another source, and other limiting factors.

In your library, have you discontinued an automated operation for any function?

Yes	14
No	950

If yes, specify the function(s) and the reasons for discontinuing the automated operation(s).

[Only a few discontinued automated projects were reported; however, the predominant reason for discontinuation was lack of funds.]

SECTION III

CURRENT LIBRARY OPERATIONS AND SERVICES

This section deals with your library's current operations and explores how an automation-supported technical processing or reader services system might assist you.

A. CATALOGING

23. If your library does not maintain any catalog or other listing of its holdings, skip to Question 31. Otherwise, check the statements below that best describe your present catalog or other listing of holdings.

Mostly Library of Congress printed cards	255
Mostly locally prepared cards (typed, duplicated, etc.)	352
About evenly divided between LC and locally prepared cards	204
LC card number on all or most locally prepared cards	105
Standard Book Number (SBN) is added to locally prepared cards when available	51
Dictionary card catalog	613
Divided card catalog	188
Card shelflist	793
Name authority file maintained	199
Subject authority file maintained	295
Dictionary bookform catalog	31
Divided bookform catalog	15
Bookform shelflist	31
Name cross-references included in catalog	480
Subject cross-references provided in catalog	644
Serial titles, other than monographic series, in catalog	264
Copies of cards forwarded to National Union Catalog	22
Copies of cards forwarded to some other union catalog (Specify) ______________________________	

[In addition to central agency library or headquarters, the following examples of union catalogs were reported: Union Catalog of Philadelphia, Midwest Union Catalog of Medical Books, Capitol District Library Council, West Virginia Library Commission, Northeastern Pennsylvania Bibliographic Center and Rocky Mountain Region Bibliographic Center for Research.]

24. In the table below, for each type of material that your library collects. indicate the method of identification used and how extensive a catalog record is prepared for them.

	CATALOGING (HARD COPY)			CATALOGING (MICROFORM)		
TYPE OF MATERIAL	Full	Brief	None	Full	Brief	None
Books	711	189	2	36	13	34
Serials and periodicals (titles)	149	396	273	25	35	46
Technical reports	192	186	126	47	28	59
Government documents (other than technical reports)	230	243	124	33	18	32
Maps and charts	55	189	233	9	11	23
Films, filmstrips, and videotape	63	156	118	8	7	24
Pictures, transparencies, and photos	29	135	154	2	8	24
Phonorecords, tapes, and cassettes	125	280	88	3	5	22
Models and displays	8	46	125	1	2	19
Manuscripts, laboratory notebooks, etc.	39	61	106	9	5	18
Pamphlets and reprints (off-prints)	86	285	202	4	10	28
Specifications, standards, etc.	39	73	134	9	11	27
Internal reports, intelligence reports, research reports, progress reports, etc.	112	108	122	28	15	35

If your library performs cataloging for other Federal libraries, complete Questions 25 and 26; otherwise, skip to Question 27.

25. Describe your centralized cataloging service by completing the following table. [Part 1.]

TYPE OF MATERIAL	TOTAL TITLES (annual)						TOTAL VOLUMES (annual)					
	Less than 100	100 to 500	501 to 1,000	1,001 to 5,000	5,001 to 10,000	Over 10,000	Less than 100	100 to 500	501 to 1,000	1,001 to 5,000	5,001 to 10,000	Over 10,000
Books		8		9	4		1	2	5	4	1	5
Serials and periodicals	2	7	1	3			3	3	1	1	1	3
Technical reports	2	3			1	2	1	1				
Government documents (other than technical reports)	1	4	3	1				3	1	1		
Maps and charts	3						1					
Films, filmstrips, and videotape	3	1					2	1				
Pictures, transparencies, and photos	4						2					
Phonorecords, tapes, and cassettes	3	6					2	2	2		1	
Other												
Patents			1									
Pamphlets		1							1			
Models	1											

25. Describe your centralized cataloging service by completing the following table. [Part 2.]

	NUMBER OF LIBRARIES RECEIVING SERVICE							
	Within Agency				Other Federal Agencies			
TYPE OF MATERIAL	Less than 10	10 to 25	26 to 50	Over 50	Less than 10	10 to 25	26 to 50	Over 50
Books	15	3	1	1	0	1	0	0
Serials and periodicals	9	1	0	0				
Technical reports	3	0	0	0	1	0	0	0
Government documents (other than technical reports)	6	0	0	1	0	1	0	0
Maps and charts	1	0	0	0	0	0	0	0
Films, filmstrips, and videotape	1	0	0	0	0	0	0	0
Pictures, transparencies, and photos	2	0	0	0	0	0	0	0
Phonorecords, tapes, and cassettes	5	1	0	0	0	0	0	0

26. Describe the products of this centralized cataloging service by checking as many of the following as apply:

Completely processed books, etc.	29
One catalog card per title	6
Complete set of catalog cards per title	34
Book catalog	5
Listings or bibliographies	14
Book pockets or spine labels	30
Packing or invoice lists	12
Other (specify)	3

27. On the list below, check in the left column all the cataloging products your library uses now (whether or not you are currently using an automated cataloging system). [Part 1.]

CATALOGING PRODUCTS	Use Presently
Full set of catalog cards	836
Book catalog or index listing	217
Subject area listings, or special bibliographies	409
Labels for book pockets and/or spines	665
List of new titles for distribution to users	569
Statistics about items cataloged, e.g., by subject area, form of material	219
Machine-readable data for local information retrieval	25
Punched cards for each book for use in circulation or inventory control	42
Authority lists for names and/or subjects	185
LC proof slips (or computer-printed equivalent)	68
Selective dissemination of information (SDI) notices to patrons by interest profile, etc.	123

27. Then rank in the right column the products that you feel are desirable from an automated cataloging system. Rank the most desirable as "1", second most desirable as "2", etc. [Part 2: Desirability Ranking and Rating.]

CATALOGING PRODUCTS	Desirability Ranking						
	1	2	3	4	5	6	7
Full set of catalog cards	478	43	14	15	2	4	10
Book catalog or index listing	52	72	37	24	18	6	17
Subject area listings, or special bibliographies	30	123	92	65	26	22	10
Labels for book pockets and/or spines	7	169	97	56	36	28	44
List of new titles for distribution to users	30	79	151	99	44	15	22
Statistics about items cataloged, e.g., by subject area, form of material	4	20	33	26	38	25	58
Machine-readable data for local information retrieval	15	11	16	14	14	8	36
Punched cards for each book for use in circulation	6	23	19	13	26	11	30
Authority lists for names and/or subjects	8	14	17	35	22	34	43
LC proof slips (or computer-printed equivalent)	2	11	6	4	14	9	51
Selective dissemination of information (SDI) notices to patrons by interest profile, etc.	21	25	24	28	26	15	44

27. Then rate in the right column the products that you feel are desirable from an automated cataloging system. Rate the most desirable as "1", second most desirable as "2", etc. [Part 2: Desirability Ranking and Rating.]

CATALOGING PRODUCTS	Desirability Rating						
	1	2	3	4	5	6	7
Full set of catalog cards	52	5	1	0	0	0	0
Book catalog or index listing	21	5	0	0	0	0	0
Subject area listings, or special bibliographies	28	9	2	0	1	0	0
Labels for book pockets and/or spines	38	11	1	0	0	1	0
List of new titles for distribution to users	33	13	4	1	0	0	0
Statistics about items cataloged, e.g., by subject area, form of material	13	14	0	0	0	0	1
Machine-readable data for local information retrieval	5	5	1	0	0	0	1
Punched cards for each book for use in circulation	13	6	0	0	0	0	2
Authority lists for names and/or subjects	11	9	2	1	1	0	0
LC proof slips (or computer-printed equivalent)	2	6	0	0	0	0	1
Selective dissemination of information (SDI) notices to patrons by interest profile, etc.	8	11	1	1	0	1	0

28. Indicate the minimum and typical time required in your library to catalog materials or to obtain cataloging from an outside source. Place one check mark in each column, estimating the elapsed time between receiving materials and completing their cataloging.

CATALOGING TIMES	Minimum Time		Typical Time	
Within two weeks	481	62.6%	225	29.3%
More than two weeks but less than one month	162	21.1%	234	30.5%
More than one month but less than three months	87	11.3%	221	28.8%
More than three months	38	4.9%	87	11.3%
	[N = 768]		[N = 767]	

29. Check the response for each statement below that most clearly reflects your attitude toward automated cataloging services.

STATEMENT	Agree Strongly	Agree	Disagree	Disagree Strongly
An automated cataloging system could probably do a better job than we could do manually.	169	405	170	21
Our cataloging is too difficult or unique to allow us to use automated cataloging.	14	68	525	123
We would be able to change to an automated catalog record if it had the flexibility to meet all our needs.	87	512	86	9
Many of our library's acquisitions duplicate the materials acquired by many other libraries. Therefore, an automated cataloging system using catalog records prepared by a central source and distributed in machine-readable form would cut cataloging costs.	158	392	145	20
We do our cataloging faster manually than a centralized system probably could.	75	220	344	80

B. ACQUISITIONS

30. On the list below, please check all aspects of your library's cataloging in which there have been or are now problems. If there are only minor or no problems, go on to the next question.

Keeping up with rate of new acquisitions	259
Searching for cataloging data hampered due to lack of trained staff	174
Searching for cataloging data hampered due to lack of needed bibliographical tools	137
LC cataloging not prompt enough for our use	205
LC cataloging doesn't cover major part of our acquisitions	116
Standard subject headings or index terms are not precise enough for our use	124
Establishing corporate entries	51
Cataloging foreign publications	62
Subject analysis and classification in our subject areas	89
Reclassification of some or all of the collection	136
Lack of consistency among our catalogers, or between past and present cataloging practices	260
Cataloging non-book materials	259

[Respondents were invited to specify other cataloging problems. This brought out the major concern in the backlog in cataloging due to lack of staff.]

31. Describe your acquisition policies and procedures by checking as many of the following statements as apply:

We use an order form supplied by a commercial library supply house.	134
We use an order form developed by this library.	97
We use a publication order form that is standard for most or all libraries in our agency.	326
We use a procurement form that is standard in our agency for purchase of all kinds of supplies.	564
We use none of the forms specified above.	52
All of our library materials are purchased from one fund.	315
We purchase materials from more than one fund.	469
All of our items are ordered by this library.	423
All of our items are ordered centrally.	125
Some items are ordered locally and some centrally.	372
We must go through a bidding procedure to purchase library materials.	229

32. Indicate below the percentage of total acquisitions that are received by the following methods:

METHOD	Estimated Percent of Total									
	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
Individual orders from this library	55	43	47	37	64	35	31	93	118	294
Materials selected by blanket order dealers	27	13	6	3	6	0	1	9	4	5
Materials received from exchange partners	141	17	11	4	5	3	1	1	2	0
Materials ordered from or selected by central agency	96	30	33	13	24	17	13	22	11	43
Publications sent automatically from Superintendent of Documents	134	8	4	1	3	1	1	2	1	0
Publications sent automatically by agency or department	248	50	42	17	31	8	5	23	7	6
Other (specify)__________________	51	9	13	4	4	0	1	5	1	5

[The most frequently cited other method was donations.]

33. Does your library purchase materials for other libraries?

Yes	48	5%
No	916	95%

[N = 964]

If yes, provide the following information:

	M	Q1	Q3	Range
Number of agency libraries submitting orders or receiving materials selected centrally [N=41]	40	10	70	10-330
Number of non-agency libraries served [N=3] (40; 150; 3,000)				
Number of titles ordered annually for other libraries [N=25]	5,000	500	10,000	250-50,000

Describe the services that you provide centrally by checking as many of the following as apply:

We provide centralized book selection.	17
We provide centralized ordering.	38
We have materials shipped directly from dealer to requesting library.	10
We receive and check materials here before shipping to requesting library.	35
We maintain fund accounting for other libraries serviced.	22

34. Indicate the minimum and typical time required in your library to obtain ordered materials, i.e., the elapsed time between placing an order and receipt of material. Place one check mark in each column:

RESPONSE TIMES	Minimum Time		Typical Time	
Within two weeks	212	27%	18	2.1%
More than two weeks but less than one month	210	26.8%	122	14.8%
More than one month but less than three months	203	25.9%	403	49%
More than three months	160	20.4%	281	34.1%
	[N=785]		[N=824]	

[It should be noted that "more than three months" includes several overseas respondents who indicated "up to and more than 1 year."]

35. On the list below, check in the left column all the acquisitions, products or services your library uses now (whether or not you are currently using an automated acquisition system). [Part 1.]

ACQUISITION PRODUCTS OR SERVICES	Use Presently
Special bibliographies or listings of newly published materials in your library's subject areas of interest	587
Order preparation and transmission to vendor or other source	511
Maintenance of order desiderata (want) lists	446
Maintenance of order status records	498
Claiming for materials not received	415
Maintenance of fund accounts	368
Reporting of statistics on vendor performance (e.g., delivery time, discount)	94
Requests for cataloging cards or other products	502

35. Then rank in the right column the products or services that you feel are desirable from an automated acquisitions system. Rank the most desirable as "1", the second most desirable as "2", etc. [Part 2: Desirability Ranking and Rating.]

ACQUISITION PRODUCTS OR SERVICES	Desirability Ranking						
	1	2	3	4	5	6	7
Special bibliographies or listings of newly published materials in your library's subject areas of interest	202	64	53	46	39	17	26
Order preparation and transmission to vendor or other source	197	97	42	30	11	14	7
Maintenance of order desiderata (want) lists	29	67	60	46	43	40	38
Maintenance of order status records	62	123	80	52	36	16	6
Claiming for materials not received	20	61	77	69	44	29	28
Maintenance of fund accounts	23	50	73	56	40	25	17
Reporting of statistics on vendor performance (e.g., delivery time, discounts)	5	15	19	13	21	18	58
Requests for cataloging cards or other products	73	61	71	53	37	23	40

35. Then rate in the right column the products or services that you feel are desirable from an automated acquisitions system. Rate the most desirable as "1", the second most desirable as "2", etc. [Part 2: Desirability Ranking and Rating.]

ACQUISITION PRODUCTS OR SERVICES	Desirability Rating						
	1	2	3	4	5	6	7
Special bibliographies or listings of newly published materials in your library's subject areas of interest	32	10	1	1	0	0	0
Order preparation and transmission to vendor or other source	21	7	2	1	0	0	0
Maintenance of order desiderata (want) lists	18	10	0	2	0	0	0
Maintenance of order status records	24	10	0	1	0	0	0
Claiming for materials not received	22	8	0	1	0	0	0
Maintenance of fund accounts	26	7	0	0	0	0	0
Reporting of statistics on vendor performance (e.g., delivery time, discounts)	10	9	2	0	0	0	0
Requests for cataloging cards or other products	29	6	1	1	0	0	0

36. Check the response for each statement below that most nearly reflects your attitude toward the automation of acquisition functions.

STATEMENT	Agree Strongly	Agree	Disagree	Disagree Strongly
A centralized system could probably do a better job of literature review and selection than we can do manually.	68	305	351	81
An automated system would be difficult to develop because of the red tape involved in acquisitions.	61	311	355	22
Records for our library would be less useful if they were maintained by an automated system.	40	209	460	32
The time required to obtain a needed item would probably be increased in an automated acquisition system.	63	252	403	29
My staff would probably have to undergo a significant amount of training to use an automated system.	165	446	153	6
An automated system could provide many products that our present system cannot.	90	459	158	10
Local agency policy would prevent our participation in a centralized acquisitions system or network.	31	193	417	19

C. SERIALS

37. Describe your present serials policies by checking as many of the following statements as apply.

We retain most serials and periodicals permanently.	239
We retain most serials and periodicals for a specific time period.	509
We discard serials and periodicals after we think the period of maximum use is over.	414
Subscriptions generally must be reveiwed and approved by someone outside this library.	266
Subscriptions can be placed on an "until cancelled" basis.	81
Subscriptions must be reordered on an annual basis.	728
Most or all of our subscriptions are ordered by our central agency library or a government purchasing agency.	420
Most of our subscriptions are ordered directly by this library.	436
We include technical reports in our serial record.	74
The majority of our serial titles are cataloged and included in our general card catalog.	155
We maintain a separate catalog (card or book form) for serials.	312

37. Continued

We catalog only the most important serial titles.	98
We microfilm or obtain microform copies of serials when possible for permanent storage.	77
The majority of our serial titles are in hard copy (i.e., not microform).	536
The majority of our serial titles are in microform.	16

38. If serials are ordered by your library, estimate the percentage of subscriptions that are:

	M	Q1	Q3	Range
Ordered through a serial dealer [N=449]	90	75	98	1-100
Ordered from publishers [N=443]	40	10	90	1-100
Received as gift or exchange [N=342]	9.5	4.5	20	1-100

39. Does your library provide a serials procurement service, i.e., order new titles, renew subscriptions, etc., for any other library?*

Yes	54
No	910

If yes, please estimate:

	M	1Q	3Q	Range
Number of libraries served (within agency) [N=44]	3	11	7	1-33
Number of libraries served (other agencies) [N=3]**				
Number of new serial titles ordered per year [N=28]	25	5	100	1-1112
Number of subscriptions renewed per year [N=37]	325	73	500	4-5000

Describe the services provided by this procurement activity by checking as many of the following as apply:

New titles	47
Renewals	48
Fund accounting	34
List of new titles available	17
Catalog copy or cards for new titles	21

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[*] [These data are as reported; it is not clear why the range of titles ordered is so low, e.g., one title ordered centrally per year.]

[**] [The three libraries serving other agencies serve 1, 5, and 140 libraries respectively.]

40. On the list below, check in the left column all the serials control tasks your library now performs (whether or not you are currently using an automated system). [Part 1.]

SERIALS CONTROL SERVICES	Use Presently
Maintain serials ordering and renewal files	648
Check-in new issues	746
Claiming of missing issues	591
Maintain subscription fund accounting records	349
Routing of serials	409
Special listings of serials holdings, e.g., by location, subject area, language, etc.	105
Maintain a union list of serials	194
Maintain bindery control records	290
Maintain title change cross-references	164
Analyze holdings or acquisitions by subject area, requester, etc., or perform other serials management analyses	91

40. Then rank in the right column the services you feel are desirable from an automated serials system. Rank the most desirable as "1", the second most desirable as "2", etc. [Part 2: Desirability Ranking and Rating]

SERIALS CONTROL SERVICES	Desirability Ranking						
	1	2	3	4	5	6	7
Maintain serials ordering and renewal files	343	73	33	13	4	2	1
Check-in issues	94	190	104	36	11	7	13
Claiming of missing issues	30	106	151	83	22	6	18
Maintain subscription fund accounting	22	72	51	80	12	13	21
Routing of Serials	19	20	25	46	54	15	55
Special listings of serials holdings, e.g., by location, subject area, language, etc.	9	19	14	14	20	35	31
Maintain a union list of serials	33	18	15	22	29	21	40
Maintain bindery control records	7	14	29	20	35	34	59
Maintain title change cross-references	3	7	13	20	27	28	72
Analyze holdings or acquisitions by subject area, requester, etc., or perform other serials management analyses	12	7	6	6	13	9	54

40. Then rate in the right column the services you feel are desirable from an automated serials system. Rate the most desirable as "1", the second most desirable as "2", etc. [Part 2: Desirability Ranking and Rating.]

SERIALS CONTROL SERVICES	Desirability Rating						
	1	2	3	4	5	6	7
Maintain serials ordering and renewal files	66	10	4	1	0	1	0
Check-in issues	38	30	11	4	0	0	0
Claiming of missing issues	31	23	17	9	0	0	0
Maintain subscription fund accounting	16	21	7	12	1	0	0
Routing of serials	22	16	8	5	1	2	1
Special listings of serials holdings, e.g., by location, subject area, language, etc.	16	10	4	3	1	0	0
Maintain a union list of serials	24	11	4	3	0	0	0
Maintain bindery control records	17	10	10	5	3	2	1
Maintain title change cross-references	19	12	4	8	2	3	0
Analyze holdings or acquisitions by subject area, requester, etc., or perform other serials management analyses	17	8	1	2	4	1	1

D. CIRCULATION

41. Please check all of the following statements that describe your library's circulation policy:

We lend to local agency staff only.	137
We lend to staff or libraries in our agency or department.	503
We lend to other Federal libraries.	502
We lend to other Federal agency staff members.	249
We lend to State or local government staff members or libraries.	261
We lend to any requesting library.	404
We lend to the general public.	221
We have no general policy; decide on an individual basis.	88

42. For the kinds of library materials listed in the table below, please check the appropriate column to indicate the average number of circulation transactions per week for your library.

	Average Circulation Transactions Per Week				
MATERIALS	1-200	201-500	501-1000	1001-2000	over 2000
Books and bound periodicals	421	187	105	84	40
Serials and periodicals (unbound)	641	66	18	11	4
Technical reports	306	22	7	3	0
Government documents (other than technical reports)	379	14	7	1	0
Maps and charts	267	2	0	1	1
Films, filmstrips, and videotape	179	8	3	0	0
Pictures, transparencies and photos	160	3	1	0	1
Phonorecords, tapes, and cassettes	333	53	14	1	1
Pamphlets and reprints (off-print)	408	14	2	1	0
Materials (all types) sent out on interlibrary loan	491	3	2	0	0
Materials (all types) requested on interlibrary loan	540	10	0	0	0

43. On the list below, check in the left column all the circulation control tasks your library now performs (whether or not you are currently using an automated system). [Part 1.]

CIRCULATION CONTROL SERVICES	Use Presently
Record loan transactions	755
Prepare overdue notices	687
Maintain list of authorized borrowers	465
Provide for hold requests (reserves)	671
Maintain circulation record that can be searched by borrower as well as call number	376
Analyze circulation by subject areas, borrower class, etc.	235
Maintain classified document inventory and control records	166
Maintain records for materials on deposit in laboratories, special reading rooms, etc.	312

43. Indicate in the right column the services that you feel are desirable from an automated circulation control system. Rank the most desirable as "1", the second most desirable as "2", etc. [Part 2: Desirability Ranking and Rating.]

CIRCULATION CONTROL SERVICES	Desirability Ranking						
	1	2	3	4	5	6	7
Record loan transactions	308	103	52	23	21	7	2
Prepare overdue notices	99	165	103	51	20	20	15
Maintain list of authorized borrowers	45	109	69	50	27	24	29
Provide for hold requests (reserves)	8	38	132	134	76	34	19
Maintain circulation record that can be searched by borrower as well as call number	59	66	61	62	61	20	12
Analyze circulation by subject areas, borrower class, etc.	15	21	21	33	63	60	21
Maintain classified document inventory and control records	29	22	12	19	16	19	44
Maintain records for materials on deposit in laboratories, special reading rooms, etc.	19	23	40	32	36	39	58

43. Indicate in the right column the services that you feel are desirable from an automated circulation control system. Rate the most desirable as "1", the second most desirable as "2", etc. [Part 2: Desirability Ranking and Rating.]

CIRCULATION CONTROL SERVICES	Desirability Rating						
	1	2	3	4	5	6	7
Record loan transactions	37	15	1	0	0	0	0
Prepare overdue notices	35	12	3	1	0	0	0
Maintain list of authorized borrowers	30	15	2	1	0	0	0
Provide for hold requests (reserves)	22	20	6	1	1	0	0
Maintain circulation record that can be searched by borrower as well as call number	22	15	1	0	0	0	0
Analyze circulation by subject areas, borrower class, etc.	13	11	1	2	0	0	0
Maintain classified document inventory and control records	12	6	1	0	0	0	0
Maintain records for materials on deposit in laboratories, special reading rooms, etc.	13	10	0	1	2	0	0

E. REFERENCE

44. For each of the reference services listed below that is provided by your library, check in the left column all the reference services your library now provides. [Part 1.]

REFERENCE SERVICES	Provide Presently
Prepare subject bibliographies	637
Prepare bibliographies for certain types of materials, e.g., maps, government documents, etc.	205
Maintain file of outside collections in your fields of interest for referral or reference service	246
Provide selective dissemination of information by subject area or other category on routine basis	240
Provide current awareness service of new publications of interest to users	561
Index and/or abstract publications locally to facilitate access to important materials	138
Provide keyword indexes (e.g., KWIC, KWOC) to all or part of collection	45
Provide some type of control over materials not given cataloging treatment	541

44. Then rank in the right column the services you feel are desirable from an automated system. Rank the most desirable as "1", the second most desirable as "2", etc. [Part 2: Desirability Ranking and Rating.]

REFERENCE SERVICES	Desirability Ranking						
	1	2	3	4	5	6	7
Prepare subject bibliographies	318	90	50	26	11	9	4
Prepare bibliographies for certain types of materials, e.g., maps, government documents, etc.	14	76	35	50	26	13	23
Maintain file of outside collections in your fields of interest for referral or reference service	28	45	78	36	32	25	29
Provide selective dissemination of information by subject area or other category on routine basis	44	88	67	39	27	11	12
Provide current awareness service of new publications of interest to users	95	142	85	57	25	16	8
Index and/or abstract publications locally to facilitate access to important materials	23	27	33	30	32	31	25
Provide keyword indexes (e.g., KWIC, KWOC) to all or part of collection	11	10	12	12	12	13	56
Provide some type of control over materials not given cataloging treatment	31	52	82	67	44	25	52

44. Then rate in the right column the services you feel are desirable from an automated system. Rate the most desirable as "1", the second most desirable as "2", etc. [Part 2: Desirability Ranking and Rating.]

REFERENCE SERVICES	Desirability Rating						
	1	2	3	4	5	6	7
Prepare subject bibliographies	40	12	1	0	0	0	0
Prepare bibliographies for certain types of materials, e.g., maps, government documents, etc.	17	10	1	1	0	0	1
Maintain file of outside collections in your fields of interest for referral or reference service	17	13	4	0	2	0	0
Provide selective dissemination of information by subject area or other category on routine basis	22	9	2	1	0	0	0
Provide current awareness service of new publications of interest to users	34	14	2	1	1	0	0
Index and/or abstract publications locally to facilitate access to important materials	14	6	1	1	1	0	0
Provide keyword indexes (e.g., KWIC, KWOC) to all or part of collection	5	8	2	0	0	2	0
Provide some type of control over materials not given cataloging treatment	23	14	2	0	2	0	0

45. Does your library perform, or contract for, an abstracting and/or indexing (A&I) service on a regular basis?

Yes	44
No	920

If yes, check as many of the following as apply:

Abstracting and/or indexing for local use only	28
Abstracting and/or indexing services supplied to other libraries and agencies	8
Abstracting and/or indexing performed on contract for other agencies	1
Abstracting and/or indexing services contracted to non-Federal organization(s)	3
Abstracting and/or indexing contracted to one or more Federal agencies	2

Complete the following:

Estimated number of abstracts prepared annually	*
Total number of annual contracts received for A&I services	*
Estimated total dollar amount	*
Total number of contracts let annually for A&I services	*
Estimated total dollar amount	*

[*Data provided in response to these questions are highly suspect, since comparisons with answers to other budget-related questions suggest that they are unreliable.]

46. Do you make any use of information retrieval from machine-readable data bases or files maintained outside your library?*

Yes	256	26.6%
No	708	73.4%
		[N=764]

If you answered "no", please skip to Question 50.

47. Please check one or more of the following statements to describe your use of information from machine-readable data bases:*

We send a written, unformatted search request to the agency maintaining data base.	82	32.0%
We send a written, formatted search request.	174	68.0%
Search requests are sent via voice telephone or TWX.	45	17.6%
We use an on-line keyboard terminal (e.g., a Teletypewriter) to perform the search ourselves.	6	0.23%
We use an on-line CRT terminal (i.e., a terminal with a TV-like screen) to perform the search ourselves.	10	03.9%
We maintain user interest profiles.	33	12.9%
We make searches in response to individual inquiries.	157	61.3%

[For each category, percentages are based on the total number (N=256) of respondents.]

[*Responses have been adjusted in cases where answers to related questions indicated that other than machine-readable data bases were used.]

48. Indicate below the volume of this information on retrieval activity:

ACTIVITY	Fewer than 25	26 - 50	More than 50
SDI profiles maintained	48	8	10
Searches made per month for all data bases	191	14	14

49. Please identify all of the machine-readable data bases from which your library retrieves information:

MARC II (Library of Congress)	22
Institute of Scientific Information data base	52
DDC Technical Abstract Bulletin (TAB)	122
NASA RECON (including STAR and others accessible through RECON)	53
MEDLARS (National Library of Medicine)	139
AIM-TWX (NLM)	12
Chemical Abstracts	33
Biological Abstracts	28
Engineering Index	30
ERIC	16
Other (specify below)	26

[Others specified by respondents included the following:

- LITE
- FAMULUS
- CRIS
- INTREDIS
- DATRIX
- Nuclear Science Abstracts
- USGRDR
- Selected Water Resources Abstracts]

50. If your library uses any of the following communication modes for the purpose listed, check the appropriate columns:

COMMUNICATION MODES	PURPOSE OF USE Reference Services	Interlibrary Loan Requests	Ordering Of Materials	Library Administration
Commercial Telephone	543	484	290	375
Federal telephone nets (FTS, Autovon, etc.)	469	460	256	421
Teletype	29	44	19	34
Facsimile Transmission	14	7	2	6
Mail	554	684	674	484

Has the availability of the Federal telephone networks improved the services your library offers to its patron?

Greatly	286	38.2%
Moderately	215	28.7%
Slightly or not at all	228	30.4%
No Access	20	2.7%

[N=749]

[Comments provided by respondents included the following:

Not always permitted to use FTS; libraries have low priority.

Only military lines are available.

Don't even have access to commercial telephones for any services.]

SECTION IV

ADMINISTRATIVE FACTORS AND PROBLEMS

51. Which of the following types of problems seem to you to bear most directly on the improvement of existing services in the Federal library community as a whole?

Inadequate budget	555
Lack of planning by library staff	89
Lack of opportunity for library staff to improve administrative techniques	200
Lack of interest in library problems at agency level	318
Lack of interest in libraries in highest governmental echelons	247
Shortage of staff	576
Lack of adequate physical facilities	524
Inadequately trained staff	206
Lack of computer and/or systems analysis support	116
Low value placed on library services by users	163
Lack of cooperation between libraries in same agency	50
Lack of cooperation between Federal libraries as a whole	105
Lack of cooperation between Federal and non-Federal libraries	76

51. Continued

Inadequate salaries for librarians	157
Lack of opportunity for Federal librarians to keep up with new techniques	277
Lack of subject specialists on library staff	134

249

52. Evaluate your library's operations according to the scale provided. Leave blank any operations your library does not perform.

OPERATIONS	Good to Excellent	Fair	Minimal Level	Serious Difficulties
Identification and selection of materials wanted for the collection	618	186	30	9
Acquisition of materials	433	298	78	37
Fund accounting and control	340	159	70	37
Claiming of missing items of all types	207	299	119	52
Descriptive cataloging	361	241	92	11
Subject analysis and classification	334	210	62	14
Abstracting and indexing	88	58	65	28
Maintenance of catalog cards and other files	551	240	44	21
Control of serial materials (journals, series, etc. but not documents and technical reports)	339	230	71	16
Control of technical reports and government publications	202	152	60	11
Control of audio-visual materials	185	135	64	15
Circulation control	520	258	43	9
Provision of reference services	483	256	57	9
Information retrieval from collection	331	170	33	13

52. (Continued)

OPERATIONS	Good to Excellent	Fair	Minimal Level	Serious Difficulties
Locating needed materials for users	596	195	20	10
Staff recruiting	138	136	69	71
Budgeting	223	189	90	62
Staff training	247	213	95	32
Systems analysis and automation planning	24	45	64	46
Long-range planning for library improvement	156	236	148	71

53. From an administrator's point of view, what operations in your library would you most like to see improved? Rank (using 1 for most needed, 2 for second most needed, etc.) as far as you care to. [Part 1.]

OPERATIONS	RANKING						
	1	2	3	4	5	6	7
Cataloging	75	55	52	35	24	25	41
Abstracting and indexing	14	11	27	18	12	3	34
Reference services	82	67	44	45	27	17	29
Reference collections	72	65	36	27	26	20	40
Location of needed materials for users	46	38	54	30	17	18	42
Identification and selection of materials	24	29	35	21	24	24	50
Ordering	105	60	39	39	24	16	42
Serial control (journals, series, etc., but not documents and technical reports)	22	23	19	18	22	14	53
Control of government publications or technical reports	20	14	7	17	9	8	51
Control of audio-visual materials	12	19	18	18	9	5	49
Circulation control	39	44	39	27	21	13	65
Clerical operations	60	34	27	26	22	20	52
Budgeting and accounting	45	35	22	20	17	15	49
Planning and administration	33	24	24	24	17	9	68
Systems analysis and automation planning	18	15	14	6	7	4	45
Staff recruiting	45	22	25	11	11	6	50
Staff training	36	32	20	31	16	13	60

53. From an administrator's point of view, what operations in your library would you most like to see improved? Rate (using 1 for most needed, 2 for second most needed, etc.) as far as you care to. [Part 2.]

OPERATIONS	RATING						
	1	2	3	4	5	6	7
Cataloging	52	9	2	0	0	0	0
Abstracting and indexing	24	9	0	0	0	0	0
Reference services	61	7	2	1	0	0	0
Reference collections	71	9	0	0	0	0	0
Location of needed materials for users	47	7	2	0	0	0	0
Identification and selection of materials	31	9	3	0	0	0	0
Ordering	75	8	2	0	0	0	0
Serial control (journals, series, etc., but not documents and technical reports)	34	10	0	0	0	0	0
Control of government publications or technical reports	21	8	0	0	1	0	0
Control of audio-visual materials	23	6	1	0	0	0	0
Circulation control	49	7	3	2	0	0	0
Clerical operations	59	7	4	0	0	1	0
Budgeting and accounting	41	9	2	3	0	0	0
Planning and administration	39	7	2	0	1	0	0
Systems analysis and automation planning	21	6	0	0	0	0	0
Staff recruiting	35	4	1	0	0	0	0
Staff training	43	10	1	0	0	0	0

54. What present service to your users do you think most needs improvement?

[Major areas are presented in descending order of frequency.]

1. Reference (service and collection)
2. Additional space
3. Additional staff
4. Acquisitions
5. Cataloging
6. Bibliography preparation

What new service would you most like to add to serve your users best?

1. Additional staff
2. Additional space
3. Collection-related responses (e.g., more up-to-date reference materials; audiovisual materials; microforms)
4. Photocopying